

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>				1. CONTRACT ID CODE	PAGE OF PAGES 1   194
2. AMENDMENT/MODIFICATION NO. 0001		3. EFFECTIVE DATE 8 OCT 2020	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)	
6. ISSUED BY CODE W912PL		7. ADMINISTERED BY (If other than Item 6) SEE ITEM 6		CODE	
U.S Army Corps of Engineers, Los Angeles Dist CESPL-CT-E, East Region Branch 915 Wilshire Blvd. Los Angeles, CA 90017					
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)				(X)	9A. AMENDMENT OF SOLICITATION NO. W912PL-21-B-0002
					9B. DATED (SEE ITEM 11) 18 September 2020
					10A. MODIFICATION OF CONTRACT/ORDER NO.
					10B. DATED (SEE ITEM 13)
CODE		FACILITY CODE			

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

**13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS.  
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
<input type="checkbox"/>	
<input type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
<input type="checkbox"/>	D. OTHER (Specify type of modification and authority)

**E. IMPORTANT:** Contractor  is not,  is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

FY18 GROUND TRANSPORT EQUIPMENT FACILITY, FORT HUACHUCA, AZ

SEE CONTINUATION PAGE FOR SUMMARY OF CHANGES

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED	16B. UNITED STATES OF AMERICA
(Signature of person authorized to sign)			(Signature of Contracting Officer)
		16C. DATE SIGNED	

GROUND TRANSPORTATION EQUIPMENT BUILDING (GTBE) FORT HUACHUCA  
AMENDMENT 0001 SUMMARY OF CHANGES

SPECIFICATIONS:

1. Section 00 73 00 : Add FAR Clause 52.217-7 (Mar 1989) which gives the Government up to 120 calendars days after contract award to exercise any or all options.
2. Add Geotechnical Report.
3. Add Drawing CS 102 UXO Clearance Boundary and Mob Site.
4. Add Section 09 84 20 - ACOUSTICAL WALL PANELS
5. Replace Technical Specifications Table of Contents
6. Replace Specification 01 32 01 Paragraph 1.3 Removing requirement for dedicated on-site scheduler.
7. Replace submittal register on Section 01 33 00-SUBMITTAL PROCEDURE
8. Replace Technical Specification 01 50 00 Paragraph 3.1.1.b revising Utility Rates.
9. Replace Section 12 48 13 Entrance Floor Mats and Frames.
10. Replace Section 13 48 56 Paragraph 2.2 Bridge Deck require non-slip aluminum.

Section 00 73 00 - Supplementary Conditions

CLAUSES INCORPORATED BY FULL TEXT

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**52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK  
(APR 1984) - ALTERNATE I (APR 1984)**

The Contractor shall be required to (a) commence work under this contract within 10 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 660 calendar days after the date the Contractor receives the notice to proceed. The time stated for completion shall include final cleanup of the premises.

(End of clause)

**52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)**

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of \$2,359.00 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of clause)

**52.211-13 TIME EXTENSIONS (SEP 2000)**

Time extensions for contract changes will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements related to the changed work and that the remaining contract completion dates for all other portions of the work will not be altered. The change order also may provide an equitable readjustment of liquidated damages under the new completion schedule.

(End of clause)

**52.217-7 OPTION FOR INCREASED QUANTITY-SEPARATELY PRICED LINE ITEM (MAR 1989)**

The Government may require the delivery of the numbered line item, identified in the Schedule as an option item, in the quantity and at the price stated in the Schedule. The Contracting Officer may exercise any or all options by written notice to the Contractor within 120 calendar days after contract award. Delivery of added items shall continue at the same rate that like items are called for under the contract, unless the parties otherwise agree.

(End of clause)

**52.236-2 DIFFERING SITE CONDITIONS (APR 1984)**

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

(End of clause)

**52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)**

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general

and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;

(2) the availability of labor, water, electric power, and roads;

(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;

(4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

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

(End of clause)

#### **52.236-4 PHYSICAL DATA (APR 1984)**

Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

(a) The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys, and soil borings.

(b) Weather conditions. The contractor shall make his/her own investigations as to weather conditions at the site . . . . .

(c) Transportation facilities. The contractor shall make his/her own investigations as to transportation facilities. Access ways shall be investigated by the contractor to satisfy himself/herself as to their existence and allowable use.

(d) Other pertinent information. None

(End of clause)

**52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)**

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(c) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable.

(End of clause)

**52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)**

At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the worksite a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

(End of clause)

**52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)**

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

(End of clause)

**52.236-8 OTHER CONTRACTS (APR 1984)**

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

(End of clause)

**52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)**

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(b) The Contractor shall protect from damage all existing improvements and utilities

(1) at or near the work site, and

(2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.



(End of clause)

**52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)**

(a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

(End of clause)

**52.236-12 CLEANING UP (APR 1984)**

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

(End of clause)

**52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)**

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

(End of clause)

#### **52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)**

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

(End of clause)

#### **52.236-17 LAYOUT OF WORK (APR 1984)**

The Contractor shall lay out its work from Government established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

(End of clause)

## **52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)**

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by," or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," as indicated", "as detailed", or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed".

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail (1) the proposed fabrication and assembly of structural elements, and (2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and

similar materials furnished by the contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor.

(End of clause)

#### **252.236-7000 MODIFICATION PROPOSALS - PRICE BREAKDOWN. (DEC 1991)**

(a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.

(b) The price breakdown --

(1) Must include sufficient detail to permit an analysis of profit, and of all costs for --

(i) Material;

(ii) Labor;

(iii) Equipment;

(iv) Subcontracts; and

(v) Overhead; and

(2) Must cover all work involved in the modification, whether the work was deleted, added, or changed.

(c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.

(d) The Contractor's proposal shall include a justification for any time extension proposed.

### **252.236-7001 CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000)**

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall--

(1) Check all drawings furnished immediately upon receipt;

(2) Compare all drawings and verify the figures before laying out the work;

(3) Promptly notify the Contracting Officer of any discrepancies;

(4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general--

(1) Large-scale drawings shall govern small-scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

Refer to Index of Contract Drawings

(End of clause)

**UNAUTHORIZED INSTRUCTIONS FROM GOVERNMENT OR OTHER PERSONNEL:**

Authorities/Technical Direction: The Contractor shall take no direction from any Government employee or any other person other than the Government contracting Officer that changes the terms and conditions of this contract action, the scope, or any change that impacts the cost, price, or schedule. Changes authorized by the Contracting Officer will be in the form of a written, official, signed modification to the contract action received by the Contract before the Contractor will act upon those changes. The Contract will comply with the Changes clause of this contract when the contractor believes direction has been given from persons other than the Government Contracting Office that equate to a change by notifying the Contracting Officer as directed by the clause. Any direction given by any Government employee or any other person outside their authority must be reported to the Contracting Officer. Contracting Officer Representative (CORs) are limited to the authorities stated in the COR appointment letters. If a COR is appointed under this contract, they will be appointed by written letter from the Contracting Officer to the Contractor and COR specific to this contract only. COR appointment letters from previous contract at this installation are not valid for this contract

**REQUIRED INSURANCE:**

Insurance is required as follows:

- (a) Either Workman's Compensation or Employer's Liability Insurance with a minimum limit of \$100,000.00.
- (b) General Liability. The Contracting Officer shall require bodily injury liability insurance coverage written on the comprehensive form or policy of at least \$500,000.00 per occurrence.
- (c) Automobile Liability Insurance for Bodily Injury and Property Damage with minimum limits of \$200,000.00 for injury or death of any one person; \$500,000.00 for each accident or occurrence of bodily injury liability; and \$20,000.00 for each accident or occurrence for property liability.
- (d) In every case the insurance coverage shall amount to at least the limits stated above. However, where the Financial Responsibility Compulsory Insurance Law of the State in which the installation is located requires higher limits, the Automobile Liability Insurance Policy should provide coverage of at least those limits.

Prior to the commencement of work hereunder, the Contractor shall furnish to the

Contracting Office a certificate or written statement of the above required insurance. The policies evidencing required insurance shall contain an endorsement to the effect that cancellation or any material change in the policies adversely affecting the interests of the Government in such insurance shall not be effective until 10 days after written notice thereof to the Contracting Officer.

The Contractor agrees to insert the substance of this clause, including this paragraph, in all subcontracts hereunder.

## **WARRANTY OF CONSTRUCTION WORK**

- (a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (1) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.
- (b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.
- (c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government owned or controlled real or personal property, when that damage is the result of
  - (1) The Contractor's failure to conform to contract requirements; or
  - (2) Any defect of equipment, material, or workmanship.
- (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 1 year from the date of repair or replacement.
- (e) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.
- (f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government 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 Government, if directed by the Contracting Officer; and



- (3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer
- (h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.
- (i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material furnished by the Government nor for the repair of any damage that results from any defect in Government furnished material or design.
- (j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

## SAFETY REQUIREMENTS

The bidder's attention is directed to the latest version of U. S. Army Corps of Engineers Safety and Health Manual EM 385-1-1, which will be strictly enforced. This publication may be obtained online and is available for download <https://www.usace.army.mil/Safety-and-Occupational-Health/Safety-and-Health-Requirements-Manual/>.

Hard copies are available from the Associated General Contractors of America, (Item #3607). The U.S. Government Printing Office is sold out of its inventory of the annual. Any other Safety and Occupational specific questions can be addressed to the US Army engineer District, Los Angeles, , 915 Wilshire blvd, Suite 930; ATTN: Safety Office, Los Angeles, CA 90017.

(End of Clause)

## CONTRACTOR PERFORMANCE EVALUATIONS

The United States Army Corps of Engineers (USACE) follows the procedures for contractor performance assessments as detailed in the following guidance; FAR 42.15, DFARS 215.304 and 242.15, as well as, AFARS 5117.9005 and 5142.15 and the UAI 42.1502-100(1). In accordance with the provisions stated above, the contractor's performance shall be evaluated throughout the performance of the contract, at least once annually and at the completion of the contract.

For construction services at or above \$700,000.00, USACE will evaluate contractor's performance and prepare a performance report using the Contractor Performance Assessment Repository System (CPARS), a web based system. The systems formerly known as Architect-Engineer Contract Administration Support System (ACASS) and Construction Contractor Appraisal Support System (CCASS) were incorporated into the CPARS (<https://www.cpars.gov>).



For evaluations of contractor performance on other services acquisition (other than construction or architect engineering), the responsible roles are: (a) Services Acquisition Assessing Official (AO): The AO shall be the KO (or when designated, the COR) responsible for the services acquisition and deliverables. Services Acquisition Reviewing Official (RO): The RO shall be one level above the KO (or where a COR is designated the COR's Supervisor) assigned to the services acquisition and responsible for the management of the services acquisition performance.

The USACE Los Angeles District local CPARS Point of Contact (POC) is Abegail Banaga at by email [abegail.c.banaga@usace.army.mil](mailto:abegail.c.banaga@usace.army.mil) or Bridgett Hollier [ridgett.D.Hollier@usace.army.mil](mailto:ridgett.D.Hollier@usace.army.mil). For this acquisition the designated COR will be the assessing official with the Reviewing Official the COR's supervisor. Evaluation Schedule: A performance evaluation shall be performed annually from the date of award and at the time of contract completion. After an evaluation (interim or final) is completed by USACE, the contractor will have the ability to access, review and comment on the evaluation for a period of 30 days. The CPARS will notify the contractor with an electronic message when a completed performance evaluation is available for their retrieval from CPARS or the Past Performance Information Retrieval System (PPIRS) for finalized evaluation.

NOTE: Within 30 days from the date of award the Contractor shall provide to the Contracting Officer the name and contact information for their firms CPARS POC.

(End of Clause)

**ALTERNATE STRUCTURED APPROACH TO WEIGHTED GUIDELINE METHOD FOR CONSTRUCTION CONTRACTS (USACE ACQUISITION INSTRUCTION 215.404-73-101) (MARCH 2013)**

The following alternate structured approach shall be used for all fixed-price construction contract actions.

Factor	Rate	Weight	Value
Degree of risk	20		
Relative difficulty of work	15		
Size of job	15		
Period of performance	15		
Contractor's investment	5		
Assistance by Government	5		
Subcontracting	25		
Total	100%		

Based on the circumstances of the procurement action, each of the above factors shall be weighted from .03 to .12 as indicated below. "Value shall be obtained by multiplying the rate by the weight. The Value column when totaled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement. The profit percentage should be multiplied by the total contract costs, including general and administrative costs.

- a. Degree of risk. Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items shall generally have a higher weight than unit price items; other things to consider include the nature of the work and where it is to be performed. Consider the portion of the work to be done by subcontractors, amount and type of labor included in costs, whether the negotiation is before or after performance of the work, etc. Modifications settled before the facts have much greater risk than those settled after the fact. A weight of .03 is appropriate for after the fact equitable adjustments and/or settlements.
- b. Relative Difficulty of Work: If the work is difficult and complex, the weight should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some other things to consider are the nature of the work, by whom it is to be done (i.e., subcontractors, consultants), what is the time schedule.
- c. Size of Job. Work of \$100,000 or less shall be weighted at .12. Work estimated between \$100,000 and \$5,000,000 shall be proportionately weighted from .12 to .05. Work from \$5,000,000 to \$10,000,000 shall be weighted at .04. Work in excess of \$10,000,000 shall be weighted at .03. It should be noted that control of fixed expenses generally improves with increased job magnitude
- d. Period of Performance. Work not to exceed one month is to be proportionately weighted at .03. Work in excess of 24 months is to be weighted at .12. Durations between one month and 24 months are to be proportionately weighted between .03 and .12.
- e. Contractor's Investment. To be weighted from .03 to .12 on the basis of below average, average and above average. Things to consider include amount of subcontracting, Government-furnished property or data such as surveys, soil tests, method of making progress payments, and any mobilization payment items.
- f. Assistance by Government. To be weighted from .12 to .03 on the basis of average to above average. Consider use of Government-owned property, equipment and facilities, and expediting assistance.
- g. Subcontracting. To be weighted inversely proportional to the amount of subcontracting. Where 80% or more of the work is to be subcontracted use .03. The weighting should be

increased proportionately to .12 where all the work is performed by the contractor's own forces.

(End of clause)

### **CONTRACTOR SUPPLY AND USE OF ELECTRONIC SOFTWARE FOR PROCESSING DAVIS-BACON ACT CERTIFIED LABOR PAYROLLS (APR 2011)**

The contractor is encouraged to use a commercially-available electronic system to process and submit certified payrolls electronically to the Government. This requirement for preparing, processing and providing certified labor payrolls are established by the Davis Bacon Act as stated in FAR 52.222-8, PAYROLL AND BASIC RECORDS and FAR 52.222-13, COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS.

If the contractor elects to use an electronic Davis-Bacon payroll processing system, then the contractor shall be responsible for obtaining and providing for all access, licenses, and other services required to provide for receipt, processing, certifying, electronically transmitting to the Government, and storing weekly payrolls and other data required for the contractor to comply with Davis-Bacon and related Act regulations. When the contractor uses an electronic Davis-Bacon payroll system, the electronic payroll service shall be used by the contractor to prepare, process, and maintain the relevant payrolls and basic records during all work under this construction contract and the electronic payroll service shall be capable of preserving these payrolls and related basic records for the required three (3) years after contract completion. If the contractor chooses to use an electronic Davis-Bacon payroll system, then the contractor shall obtain and provide electronic system access to the Government, as required, to comply with the Davis-Bacon and related Act regulations over the duration of this construction contract. The access shall include electronic review access by the Government contract administration office to the electronic payroll processing system used by the contractor.

The contractor's provision and use of an electronic payroll processing system shall meet the following basic functional criteria: commercially available; compliant with appropriate Davis Bacon Act payroll provisions in the FAR; able to accommodate the required number of employees and subcontractors planned to be employed under the contract; capable of producing an Excel spreadsheet-compatible electronic output of weekly payroll records (format at <http://www.rmssupport.com/guides.aspx>) for export in an Excel spreadsheet to be imported into the contractor's Quality Control System (QCS) version of Resident Management System (RM), that in turn shall export payroll data to the Government's Resident Management System (RMS); demonstrated security of data and data entry rights; ability to produce contractor-certified electronic versions of the weekly payroll data; ability to identify erroneous entries and track the data/time of all versions of the certified Davis Bacon payrolls submitted to the government over the life of the contract; capable of generating a durable record copy, that is, a CD or DVD and PDF file record of data from the system database at end of the contract closeout. This durable record copy of data from the electronic Davis-Bacon payroll processing system shall be provided to the Government during contract closeout.

All contractor-incurred costs related to the contractor's provision and use of an electronic payroll processing service shall be included in the contractor's price for the overall work under the contract. The costs for Davis Bacon Act using electronic payroll processing services shall not be a separately bid/proposed or reimbursed item under this contract.

(END OF CLAUSE)

## **ACCRUALS**

In accordance with USACE Engineer Financial Regulation (ER) 37-1-30, and other applicable Federal and DOD financial accounting standards, the Contractor is required to assist government personnel with providing reasonably accurate accrual estimates. The accrual is from the thru date of the period of performance (Eng Form 93, block 9) to the end for the month of the value of goods and/or services rendered/expected to be rendered to the Government pursuant to this contract. This is for each calendar month during which goods and services are delivered. Standard forms with instructions will be provided by the Government to assist with meeting this requirement. These monthly estimates, which facilitate timely entry of accruals, must be received by the Government on or before six (6) business days prior to each calendar month-end. Please contact Mr. Richard Wagner 213-452-3307 or email at [Richard.S.Wagner@usace.army.mil](mailto:Richard.S.Wagner@usace.army.mil) for further information.

(END OF CLAUSE)

## **NOTICE TO CONTRACTOR**

Only a warranted Contracting Officer (either PCO or ACO) acting within their delegated limits has the authority to issue modifications or otherwise change the terms and conditions of this contract. If an individual other than the Contracting Officer attempts to make changes to the terms and conditions of this contract you shall not proceed with the change and shall immediately notify the Contracting Officer.

## **VETERANS EMPLOYMENT**

Veterans Employment Emphasis for U.S. Army Corps of Engineers Contracts  
In addition to complying with the requirements outlined in FAR Part 22.13, FAR Provision 52.222-38, FAR Clause 52.222-35, FAR Clause 52.222-37, DFARS 222.13 and Department of Labor regulations, U.S. Army Corps of Engineers (USACE) contractors and subcontractors at all tiers are encouraged to promote the training and employment of U.S. veterans while performing under a USACE contract. While no set-aside, evaluation preference, or incentive applies to the solicitation or performance under the resultant contract, USACE contractors are encouraged to seek out highly qualified veterans to perform services under this contract. The following resources are available to assist USACE contractors in their outreach efforts:

FY18 Ground Transport Equipment Facility  
Ft Huachuca, AZ

W912PL21B0002  
Amendment 0001

Federal Veteran employment information at <http://www.fedshirevets.gov/index.aspx>  
Department of Labor Veterans Employment Assistance <http://www.dol.gov/vets/> Department  
of Veterans Affairs–VOW to Hire Heroes Act <http://benefits.va.gov/vow/>  
Army Wounded Warrior Program – <http://wtc.army.mil/modules/employers/index.html>  
U.S. Chamber of Commerce Foundation–Hiring Our Heroes <http://www.hiringourheroes.org/>  
Guide to Hiring Veterans – Reference Material  
[http://www.whitehouse.gov/sites/default/files/docs/white\\_house\\_business\\_council\\_-\\_guide\\_to\\_hiring\\_veterans\\_0.pdf](http://www.whitehouse.gov/sites/default/files/docs/white_house_business_council_-_guide_to_hiring_veterans_0.pdf)

(END OF SPECIAL CLAUSE)

**GROUND TRANSPORT EQUIPMENT BUILDING, (GTEB)**

Fort Huachuca  
Cochise County, Arizona  
PN 466281; Spec #2145

**- FINAL GEOTECHNICAL REPORT-**

August 2018

Prepared By:

Soil Design Section  
USACE Sacramento District

# **GROUND TRANSPORT EQUIPMENT BUILDING, (GTEB)**

Fort Huachuca  
PN 466281; Spec #2145

## **1. INTRODUCTION**

This report will provide final design parameters for a new building complex, access roads, utility conduits, and pavements.

Personnel involved with project design are:

- Project Manager, John Rob Lewis, Los Angeles District, (520) 906-7780
- Technical Lead, Matthew Valentine, Sacramento District, (602) 230-6888
- Structural Engineer, Kishan Patel, Sacramento District, (916) 557-7648
- Civil Engineers, Huff Horton, Albuquerque District, (505) 342-3404
- Geotechnical Engineer, Fiorella Fuentes, Sacramento District, (916) 557-7063

## **2. PROPOSED IMPROVEMENTS**

### **2.1 General**

This project will construct a new Ground Equipment Building Complex. Project includes a vehicle maintenance shop (GTEB), organizational storage building, organizational vehicle parking, vehicle wash platform, vehicle loading dock, petroleum, oils and lubricants (POL) storage, and other hazardous waste/material storage. Appurtenances to the project will include utilities, slabs-on-grade, and pavements; with the following major items listed in the sections below. The project site lies in a 200-acre area of the Electronic Proving Ground Test Facilities Complex, under development. The EPG Complex project sites lie in the northwest portion of the main cantonment area, approximately one mile inside the installation boundary as shown in the figure below.





Figure 1: Project Site

## **2.1 Ground Transport Equipment Building Complex**

This project involves the construction of a 35,290-square-foot vehicle maintenance shop (ground transport equipment building), organizational storage building, vehicle wash platform, vehicle loading dock, petroleum-oils-lubricants (POL) storage, and other hazardous waste/material storage. All these structures will be supported on shallow foundation consisting of isolated column and continuous spread footings.

## **2.2 Access Roadway and Parking Area**

The project includes paved access roadways, a large organizational vehicle parking compound, a facility parking area, and a right-turn slip lane at Hunt Avenue and Arizona Street intersection



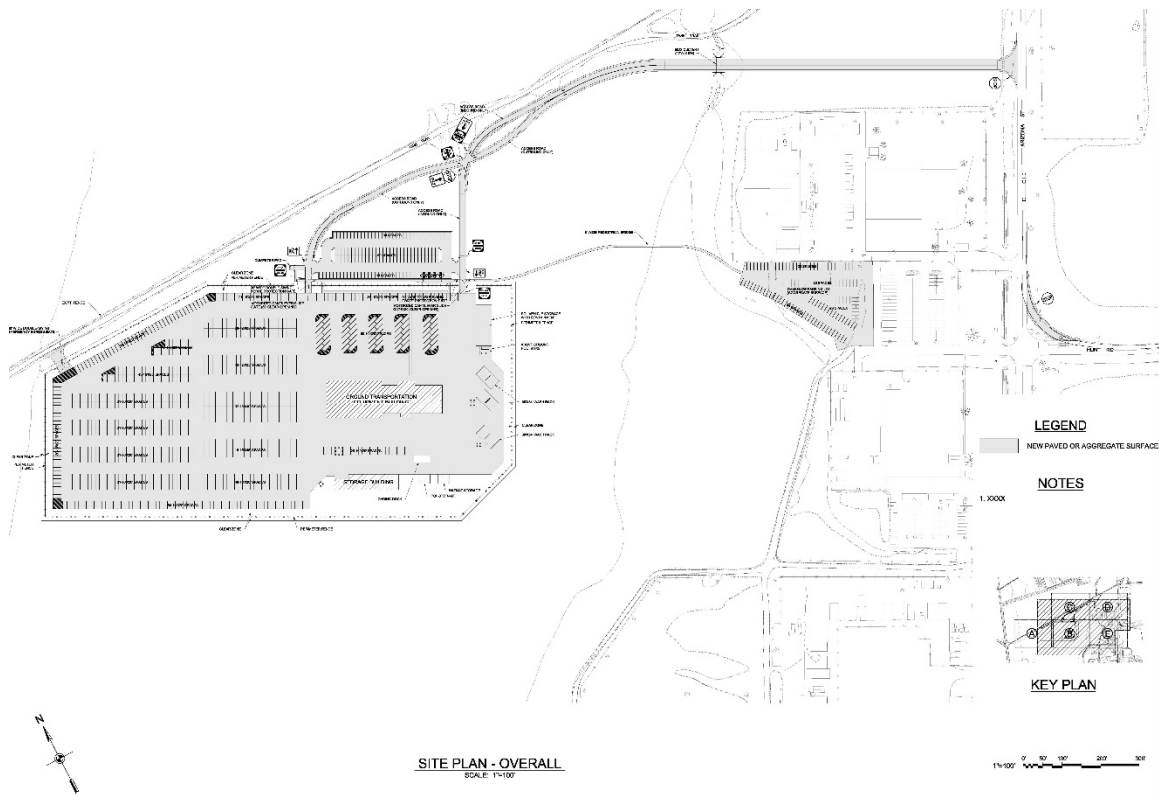


Figure 2: Site Layout

### 3. FORT HUACHUCA

#### 3.1 Geomorphology

Fort Huachuca is located in southwestern Cochise County, Arizona, approximately 70 miles southeast of Tucson. The reservation extends from the crest of the Huachuca Mountains (elevation 8,406 feet) and descends to the San Pedro River (elevation 3,700 feet). The base is situated at an elevation of approximately 4,900 feet. The Huachuca Mountains are composed of limestones, shales, as well as quartzite, granite, quartz monzonite, and other volcanic rock. The formations range in age from early Cambrian to late Cretaceous. Numerous quartz dikes run through the various rock formations. Although the bedrock nearest the base built-up area is very hard quartzite and quartz monzonite, most of the installation is founded on coalesced alluvial fan material sloping northeast to the San Pedro River. This conglomerate consists of gravel, cobbles, and boulders in a matrix of red sandy clay or clayey sand. The deposits are very well compacted and partially cemented by carbonates. Graded deposits consisting of clays, silts, sands, gravels, and cobbles occur in old stream channels and only form a small percentage of the total subsurface material found on base. Quartzite, quartz monzonite, sandstone, and agate are the predominant rock types found in the conglomerate under the base.

## **3.2 Seismic Information**

### **3.2.1 Seismic Activity**

Fort Huachuca is located in a moderate to low risk earthquake hazard zone; the main seismic hazards in the area are shockwaves that originate from earthquakes generated along active faults in the region. Earthquakes can produce primary seismic hazards such as ground acceleration and possible surface displacements. Secondary seismic hazards include liquefaction and landslides.

Based on ADOT Report Number: AZ92-344 the project site is in the Mexico Basin and Range Zone, is generally tectonically stable and has had some tectonic activity. The report indicates the following:

Maximum Credible Earthquake – Magnitude 7.5

Peak Ground Acceleration – 0.041 with a 90% Non-Exceedance in 50 years

The soil materials at this project site are not likely to be susceptible to liquefaction or seismically induced settlements due to high density, high percentage of rock, poor gradation, and low field water contents. Due to large quantity of onsite dense cobble and boulder-sized materials, a Site Class designation of C should be used for the site per the 2012 International Building Code (IBC). The soil profile and site class designations are based on a review of available well holes within a three mile radius of the site. This data was available on ADWR's website and indicated that dense material exists to depths over 100 feet in the general vicinity of the site.

### **3.2.2 Soil Liquefaction Potential**

Soil liquefaction occurs when a soil deposit below a groundwater table experiences a substantial loss of strength when vibrated. The reason for this strength loss is that certain types of soil tend to compact when shaken and this compaction induces excess pore water pressures (in saturated soil) which tend to expand the grain structure and create a "quick flow" condition. Recently deposited, i.e., geologically young and relatively loose natural soils, and un-compacted or poorly compacted fills are potentially susceptible to liquefaction. Loose sands are particularly susceptible, and loose silts and gravels also have some potential for liquefaction. Dense natural soils and well compacted fills have low susceptibility for liquefaction. Clayey soils are generally not susceptible to liquefaction.

Based on current practices, it can be assumed that a significant hazard due to liquefaction does not exist if at least one of the following criteria is met.

- The geologic materials underlying the site are either bedrock or have very low liquefaction susceptibility.
- The soils underlying the site are stiff clays or clayey silts, unless the

soils are highly sensitive based on local experience; or, the soils are cohesionless, i.e., sand, silt, or gravels with a minimum normalized Standard Penetration Test (SPT) resistance of 30 blows per foot for depths below the ground water table or with a clay content greater than 20 percent.

- The groundwater table is at least 33 feet below the deepest foundation depth or 49 feet below the ground surface.

Based on our exploration data and upon experience from historic project excavations performed in the immediate area of the project site, materials consist of mostly gravel, cobbles, and boulders in a very well compacted or partially cemented matrix of sandy clay; therefore, the potential of liquefaction at GTEB is **not likely**.

### **3.3 Climate**

Fort Huachuca has a moderate climate characterized by mild winters and warm summers. Precipitation is light during the winter months and snowfall is unusual. Summer thunderstorms in July and August usually account for about 50 percent of the annual average rainfall of 15 inches. Winters are characterized by an average low of 24° F with prevailing wind from the southwest at an average velocity of 5.8 miles/hour. The site is located within southeastern Arizona and has a 10 psf design ground snow. Frost penetration is expected to be zero. Average maximum summer temperatures range from 86-91°F. Summer temperatures rarely exceed 96°F, except in June when temperatures of 99°F are not uncommon. Relative humidities range from 25 to 35 percent except during the summer when humidities range from about 40 to 65 percent especially during the thunderstorm season. Assume a design maximum wind speed of 90 mph.

### **3.4 Construction Materials**

Satisfactory borrow materials are normally available from the City of Sierra Vista Woodcutters Borrow Site, located next to the Veterans Memorial Cemetery on the east side of the Post along Buffalo Soldier Trail opposite Golfinks Drive. Point of contact with the City is Mr. Alan Humphrey at phone 520-458-5775. The City reports that this site historically has produced materials meeting their specifications of: maximum Plasticity Index = 15, maximum of 35 percent finer than No. 200 sieve, and sum of actual percent values not exceeding 45. Disposal of excavated or demolished materials free of organics, wood, debris, and rebar/steel, may be disposed on-Post at the Clean Fill Disposal Site located approximately 1 mile northwest of the intersection of Irwin Street and Westside Road; see the project drawing G-sheets. Coordinate use and exact location with Fort or City personnel. Water for construction is available at the site.

### 3.5 Groundwater

No ground water was encountered in any of the trenches during exploration.

### 3.6 Laboratory Analysis

Representative samples obtained during the field explorations were subjected to the following laboratory tests.

Table 1: Laboratory Testing

Type of Test	Test Method	Number of Sampled Tested
Sieve Analysis	ASTM D422	2
Atterberg Limits	ASTM D4318	2
pH, Resistivity	AZ Test 237b, 236b	2
Sulfate Content	AZ Test 733b	2
Chloride Content	AZ Test 736b	2
Max. Dry Density and Optimum Moisture	ASTM D1557	2
CBR	ASTM D1883	1

The Results of the laboratory tests are presented in Appendix B.

## 4. EXPLORATION WORK

### 4.1 General Exploration Information

Exploration labeled 4F-17-01 through 6 were performed on 14 November 2017 at the proposed GTEB Complex area, using a PC 160 KOMATSU backhoe fitted with a 2-foot wide bucket. Work was performed by Don's Excavation Services, LLC under the supervision of Ms. Fiorella Fuentes, USACE Sacramento, Soil Design Section. Ms. Fuentes logged all of the trenches (see **Appendix A** to this report) and collected all of the sampled materials.

### 4.2 Subsurface Conditions

In general, the upper few feet of soils encountered in project trenches were relatively uniform. The surface is covered with vegetation, cobbles, and boulders. The near surface soils encountered in the trenches and extending to the maximum depths of our exploration (5 to 8 feet), consisted of clayey sand and gravel containing cobbles and boulders. Cobbles sizes ranged from 3 to 10 inches and boulder sizes ranged from 18 to 24 inches in test pits located within and adjacent to the site. Soils were dense, with low to medium plasticity fines. Refusal occurred at depths from 5 to 8 feet in this material. Soil moisture contents were described as dry. No groundwater was observed in any of the trenches during explorations.

### **4.3 Laboratory Data**

Laboratory testing was performed on selected site-specific boring samples. See **Appendix B** for a copy of the lab test results.

#### **4.3.1 Soil Corrosivity, Chloride and Sulfate Content Results**

Limited laboratory chemical testing was performed on site-specific samples from two trenches in the vicinity of the proposed complex, reference Table 1 above. Soil pH and resistivity tests were performed on two soil samples received from the field. The laboratory test results of pH yielded values of 7.1 to 7.2. Values of pH that are less than 5.5 indicate corrosive environment. The soil samples tested for minimum resistivity yielded test results of 1,868 and 1,934 ohm-cm indicating that the anticipated soils at field moisture are severely corrosive. **All underground ferrous materials should be coated or wrapped or otherwise protected** against the galvanic action of the soil. Chloride tests performed on the soil samples yielded results of 6 and 19 ppm, values much less than the maximum chloride ion content that would be a concern for corrosion. The samples tested for sulfate content yielded lab values of 35 and 53 ppm. ACI 318 classifies sulfate exposure less than 150 ppm as low and therefore injurious sulfate attack is not a concern.

In general, the sulfate and chloride contents at Ft Huachuca soils have been found to be low or negligible, but as a low-cost precaution, Type II or Type V Portland Cement meeting low-alkali requirements will be specified.

For durability, we recommend a maximum water-cement ratio of 0.45 by weight and a minimum 28-day compressive strength of 4,000 psi.

### **4.4 Borrow Materials**

Locally excavated materials generally will not be satisfactory for backfill for structures and utilities without processing (primarily screening) to remove the oversized (cobble and boulder) materials. We estimate these materials will comprise an average of 20 percent of project-required excavations. On-post borrow sites are not being used but the Woodcutters Borrow Site operated by the City of Sierra Vista is available as discussed in paragraph 3.5 Construction Materials. Specifications will require the Contractor to develop off-post borrow sites as required.

## **5. GEOTECHNICAL ANALYSIS AND DESIGN**

### **5.1 Seismic Acceleration Parameters**

As stated in paragraph 3.3.1 above, the project is assigned **Soil Site Class C** in accordance with the 2015 IBC and ASCE 7-16.

The site is located at Latitude 31.57445° North and Longitude -110.35086° West. A summary of the seismic factors applicable to the site is provided in Table 2 below. Site coefficient values of 1.2 and 1.7 for  $F_a$  and  $F_v$ , respectively, are

obtained for the site. The following estimated ground motion parameters have been established using methods outlined in the 2012 IBC with reference to the acceleration contour maps provided by the U.S. Geological Survey (USGS) and the National Seismic Hazard Mapping Project. Reference the USGS seismic design summary report on Appendix C.

*Table 2: MCE Mapped Accelerations*

GTEB Site			
Location: 31.57445° N , 110.35086° W			
Site Class C			
Period (s)	MCE Mapped Acceleration Parameters (g)	Adjusted MCE Acceleration Parameters (g)	MCE Design Acceleration Parameters (g)
PGA	0.120	0.120	0.08
0.2	0.243	0.292	0.195
1	0.071	0.120	0.08

## 5.2 Native Materials

The following data apply to foundation, retaining, and pavement structures placed against properly compacted native on-site materials and on or against locally obtained borrow materials. Data are moderately conservative because of the variability of local excavation and borrow materials.

*Table 3: Design Property Table*

Design Soil	GC, Clayey Gravel with Sand
Design Total Unit Weight, $\gamma$	133 pounds/ cubic foot
Internal friction angle, $\emptyset$	34°
Active coefficient, $K_a$	0.28
At-rest coefficient, $K_0$	0.44
Passive coefficient, $K_p$	3.54
Sliding Coefficient, $\mu$	0.45
Design cohesion	None

The project soil materials will normally require about 1 percent strain (deflection or movement as a percent of wall height) to develop passive resistance. If lateral movement is to be closely constrained, such as with the 4-sided elevator pit, design via the “at-rest” condition or utilize an appropriate factor of safety for the passive condition. Cantilever structures that can tolerate movement away from the earth backfill may use the active coefficient. Retention systems should be provided with appropriate drainage of backfill materials as described below, unless they are designed and reinforced assuming saturated conditions.

Drawings should include details for removing drainage from the retained backfill via weep holes located within 18 inches of the bottom of wall. For foundation or other 'interior' walls where weep walls would not be appropriate, provide 4-inch diameter slotted/perforated pipes in a non-woven fabric-wrapped 12-inch-square gravel pocket located at the base of the wall (i.e. on top of the footing) and connected to solid drain pipes draining to open swales or storm drains beyond the wall end. The AOS of the fabric should be no larger than U.S Sieve Size No. 30 and no smaller than Size No. 70. For the gravel, use ASTM C 33 Size No. 57 or 67, i.e. 'capillary water barrier' material'.

### **5.3 Structure Foundations and Interior Slabs on Grade**

#### **5.3.1 Ground Preparation**

Prepare the ground surface in fill areas and in areas cut to grade by scarifying, moisture conditioning and compacted the exposed surface soils to a depth of 6 inches.

In spread footing areas, remove (and stockpile for future use) soils from beneath and 1.5 feet beyond all footing to a minimum depth of 1.5 feet below the bottom of footings. The exposed surface after removal should be moistened and compacted to at least 90% of maximum density as determined by ASTM D 1557 prior to backfilling. Do not allow surface water to enter or collect in foundation excavations.

Foundation excavation and backfilling and footing construction should proceed expeditiously to minimize potential disturbance to the bearing soil. Bearing soil that is softened or disturbed should be removed from the foundation excavation prior to placing concrete. Foundation concrete should not be placed on loose soil, ponded water or debris. Backfill against exterior foundation walls and footings and extending at least 3 feet beyond the footing edge shall consist of excavated native clayey soils containing at least 20 percent low to medium plasticity fines; this is to minimize infiltration of surface drainage into the building sub slab area. Drawings need to include necessary details showing the over-excavation limits and this special low-permeability backfill zone.

For pavement areas, including equipment pads, scarify, moisture condition and compact the exposed subgrade to at least 90% of maximum density as determined by ASTM D 1557. For fill areas, compact to at least 95% of maximum density as determined by ASTM D 1557. Placement and compaction will be described in specification Section 31 00 00 that Soil Design will prepare.

#### **5.3.2 Foundation & Slabs**

The most economical foundation for the GTEB at this location will be a shallow foundation consisting of continuous wall and/ isolated column footings, or thickened-edge slab-on-grade or similar construction for any small prefabricated buildings, minimum footing dimensions (minimum column footing horizontal dimension = 24 inches, minimum continuous wall footing width = 18 inches).

Table 4: Foundation Design

Founding depth below finished grade	2 ft min	4 ft
Footing width	<24 in	>24 in
Maximum net allowable load bearing capacity, $Q_a$	2.5ksf	4.0 ksf
Allowable temporary dynamic load	1 ksf	1.33 ksf

Interior slabs-on-grade shall be isolated from footings. A minimum 6-inch cushion of sand or capillary water barrier shall be used in areas where the slab-on-grade passes over footings or grade beams. All interior slabs-on-grade shall be placed on a capillary water barrier and prepared subgrade as shown in Table 5 below. The vapor barrier and overlying sand cushion are only to be used beneath rooms/areas where moisture-sensitive flooring materials (e.g. carpet or synthetic tile) will be placed on the slab-on-grade concrete.

Table 5: Design for interior slabs-on-grade

Minimum slab thickness	6-inches
Compressive strength, $f_c'$	4,000 psi
Sand cushion	2-inches, per ASTM C 33, concrete fine aggregate
Polyethylene sheet vapor barrier	15-mil, per ASTM E 1745 Class A
Capillary water barrier	6-inches of ASTM C-33, size 57 aggregate
Subgrade	12-inches structural fill over satisfactory material, compacted to 95% ASTM D 1557
Joints	12-feet maximum, aspect ratio: 1.25 to 1.0

Floor slabs accessible to forklifts or other vehicle traffic and those for mechanical/equipment room shall be minimum 8-inch thick Portland cement concrete, or thicker as determined by the Structural Engineer. Slabs for office or other light-duty uses shall be minimum 6-inch thick PCC.

#### 5.4 Settlement

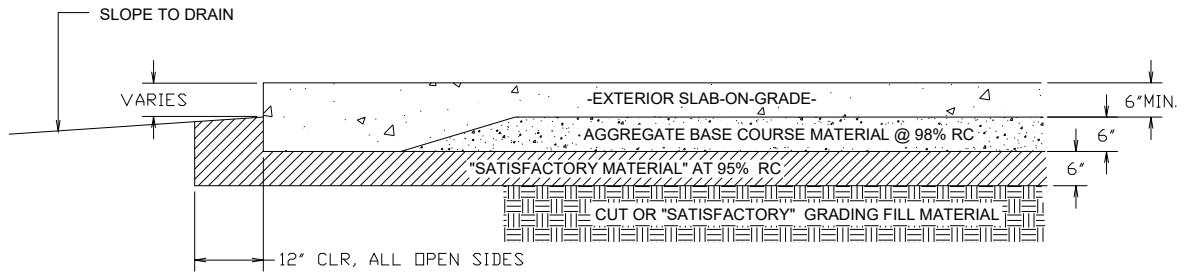
Settlement will be elastic and of short duration, mostly taking place during the period of construction. Estimated settlement under the allowable loading is 0.72 inches over the life of the structure(s).

#### 5.5 Exterior Aprons and Pads

Thickness	6-inches minimum
Compressive strength, $f_c'$	4,000 psi
Aggregate base course	6-inches, compacted to 98% ASTM D 1557
Subgrade	6-inches satisfactory material compacted to 95% ASTM D 1557

Table 6::Design for aprons and pads; see detail below





Detail 1: Typical exterior apron/slab-on-grade

## 5.6 Concrete Materials

The USGS Section 03 30 00 will be edited by Soil Design to state that all concrete for this project shall have a minimum 28-day compressive strength of 4,000 psi and a maximum water/cement ratio of 0.45. Portland cement shall be Type II or Type V meeting low-alkali requirements per ASTM C 150/C 150M. Concrete specifications will be edited to allow the use of pozzolan (flyash and/or GGBF slag), and to state that flyash shall consist of Class F low-alkali fly ash meeting ASTM C618 Table 3 requirements. Coarse aggregate will be specified to conform to ASTM C33/C33M, Class 5S, Size No. 67 or No. 57 unless otherwise specified/requested by the Structural Engineer. Fine aggregate shall conform to quality and gradation requirements of ASTM C33/C33M. ASR testing of aggregates will be specified in accordance with the NOTES in the UFGS, and will be highlighted to the Contractor as an early pre-construction testing requirement.

## 5.7 Pavements

### 5.7.1 Design Parameters

Laboratory testing included determination of the California Bearing Ratio (CBR) IAW ASTM D1883, performed on bulk samples collected at trench 4F-17-06 located along proposed access road. The results indicate a CBR of 4.5 for the sandy fat clay (CH) at 90 percent of laboratory maximum density. Historical values of  $12 < \text{CBR} < 20$  have typically been assigned to Ft Huachuca for GC-SC soils compacted to 95% of laboratory maximum. Since most of our test pit samples were classified as GC-SC, a conservative design value of  $\text{CBR} = 6$  was used for all flexible pavements including RMP at this project. Minimum subgrade compaction requirements will be specified in Section 31 00 00 to require the top 6-inches of cohesive subgrade soils shall be compacted to at least 93 percent of ASTM D1557 maximum density, and the top 6-inches of cohesionless subgrade soils shall be compacted to at least 95 percent of ASTM D1557 maximum density.

Reference Subgrade Soil: Compacted Clayey Gravel with Sand (GC)  
Conservative Subgrade California Bearing Ratio (CBR): 6  
Aggregate Base Course CBR: 80  
Subbase Aggregate Course CBR: 20  
Design Life: 25 years

### 5.7.2 Flexible Pavements

New flexible (AC) pavements at this project include a new Facility Parking and Overflow Parking and a Right-Turn Slip Lane at intersection of Arizona St and Hunt Ave. The PCASE program was used for the pavement design calculations.

Resin modified pavement (RMP) which is a composite pavement surfacing that uses a unique combination of asphalt concrete (AC) and portland cement concrete (PCC) materials in the same layer will be used at the Operation Vehicles and Equipment parking area and access road from Arizona Street to the GTEB Complex. RMP provides a tough durable surface similar to concrete, but is not hampered by time of placement after mixing constraints that must be followed for plant-batched PCC materials.

#### 5.7.2.1 Facility Parking and Overflow Parking

Two separate POV parking lots will be provided for the new GTEB complex that totals of 300 parking stalls. 132 stalls are estimated to be available for the Facility Parking. The traffic used for design of the Facility Parking and overflow parking included POVs and large pickup trucks or SUV. The resulting light-duty pavement section for Facility Parking and Overflow Parking is the following:

- 2 inches (single layer) of asphalt concrete (AC)
- 6 inches of CBR=80 Aggregate Base Course (ABC) @ 100% density
- 6 inches of CBR=20 Subbase Aggregate (SB) @ 95% density
- 6 inches (minimum) of satisfactory material fill/subgrade @ 93/95% density

#### 5.7.2.2 Operation Vehicles and Equipment Parking

The traffic used for design of the Operation Vehicles and Equipment Parking included the following traffic mix:

- M1070 HET Tractor w/M 1000 trailer (229,750 lbs) – 403,000 passes
- M1074 Load System W/Crane (86,317 lbs) – 403,000 passes
- M1A1, Main Tank Tracked (126,000 lbs) – 403,000 passes
- M2A3, BRADLEY Vehicle Tracked (58,200 lbs) – 403,000 passes
- P-23 Crash/Fire Truck (77,880 lbs) – 300 passes
- STRYKER, RECON Vehicle (43,352 lbs) – 403,000 passes

Small vehicles are irrelevant to the result, therefore they are not listed above. As expected, M1070 Tractor with M1000 Trailer carrying an M1A1 Tank (229,750lbs is the loaded weight) governed the 'RMP' pavement section design, as follows:

- 2 inches (single layer) of Resin Modified Pavement (RMP)
- 2 inches (single layer) of asphalt concrete (AC)
- 6 inches of CBR=80 Aggregate Base Course (ABC) @ 100% density
- 6 inches of CBR=20 Subbase Aggregate (SB) @ 95% density
- 6 inches (minimum) of satisfactory material fill/subgrade @ 93/95% density

Construct a 2-inch thick (compacted thickness) asphalt concrete pavement. Following AC surface construction, apply a bituminous tack coat to the pavement surface. Construct a 2-inch thick (compacted thickness) Resin Modified Pavement (RMP) overlay.

#### 5.7.2.3 Access Road

Traffic will enter through a dedicated access road that will intersect with Arizona Street and lead to the GTEB Complex. Since the access road will be a low volume road and traffic entering the complex will be the same as Operation Vehicles and Equipment Parking area, the resulting 'RMP' pavement section will be identical to that listed above for the new Operation Vehicles and Equipment Parking area, which is:

- 2 inches (single layer) of Resin Modified Pavement (RMP)
- 2 inches (single layer) of asphalt concrete (AC)
- 6 inches of CBR=80 Aggregate Base Course (ABC) @ 100% density
- 6 inches of CBR=20 Subbase Aggregate (SB) @ 95% density
- 6 inches (minimum) of satisfactory material fill/subgrade @ 93/95% density

#### 5.7.2.4 Tank Trail Road

Traffic will enter through a dedicated access road that will intersect with Arizona Street and lead to the GTEB Complex. Since the access road will be a low volume road and traffic entering the complex will be the same as Operation Vehicles and Equipment Parking area, the resulting 'RMP' pavement section will be identical to that listed above for the new Operation Vehicles and Equipment Parking area, which is:

The aggregate surfaced road section will conform the following:

- 6 inches of CBR=80 Aggregate Base Course (ABC) @ 100% density
- 6 inches of CBR=20 Subbase Course @ 95% density
- 6 inches (minimum) of satisfactory material fill/subgrade @ 93/95% density

#### 5.7.2.5 Right-Turn Slip Lane at intersection of Arizona St and Hunt Ave

The right-turn slip lane is required to accommodate the route that heavy vehicles will undertake to reach the GTEB access road. On 25 September 2017 during the charrette, the installation advised that the largest vehicle using the road would be an 80-kip truck. They also advised that no hard-wheel or tracked vehicles would use the road. The following traffic mix was used for our design:

- Passenger Cars – 403,000 passes
- P-23 Crash/Fire Truck (77,800lbs) – 600 passes
- 3-Axle Truck (35,000 lbs) – 403,000 passes
- 5-Axle Truck (80,000 lbs) – 403,000 passes

The resulting heavy-duty pavement section is the following:

- 4 inches (placed in two 2-inch layers) of asphalt concrete (AC)
- 6 inches of CBR=80 Aggregate Base Course (ABC) @ 100% density
- 6 inches of CBR=20 Subbase Aggregate (SB) @ 95% density
- 6 inches (minimum) of satisfactory material fill/subgrade @ 93/95% density

#### 5.7.2.6 Shoulders

The aggregate surfaced shoulder width should conform to the normal aggregate shoulder widths used for similar roads at the installation. Shoulder section will conform the following:

- 6 inches of CBR=80 Aggregate Base Course (ABC) @ 98% density
- 6 inches of CBR=20 Subbase Course @ 95% density
- 6 inches (minimum) of satisfactory material fill/subgrade @ 93/95% density

### 5.7.3 Aggregate Base Course

The state DOT and/or PAG materials requirements may be the most common or commercially available material. Base course specification may include use of appropriate state DOT and/or PAG specification aggregate base course materials. Aggregate Base Course shall be compacted to at least 100 percent of ASTM D 1557 maximum density in accordance with UFC 3-250-01, paragraph 6-2 and in accordance with UFGS Section 32 11 23 AGGREGATE BASE COURSE. Since 100 percent may not be achievable for a layer placed directly on clayey subgrade compacted to 93 percent, 98 percent will be specified for such instances (e.g. shoulder surfaces).

### 5.7.4 Aggregate Subbase Course

Aggregate subbase course shall be compacted to at least 95 percent of ASTM D 1557 maximum density in accordance with UFC 3-250-01 and in accordance with UFGS Section 32 11 16 AGGREGATE SUBBASE.

### 5.7.5 Flexible Pavement Repair

For the limited amount of asphalt concrete repair-repaving that may be needed during construction, we recommend matching the existing section(s) and utilizing the standard pavement repair detail below.

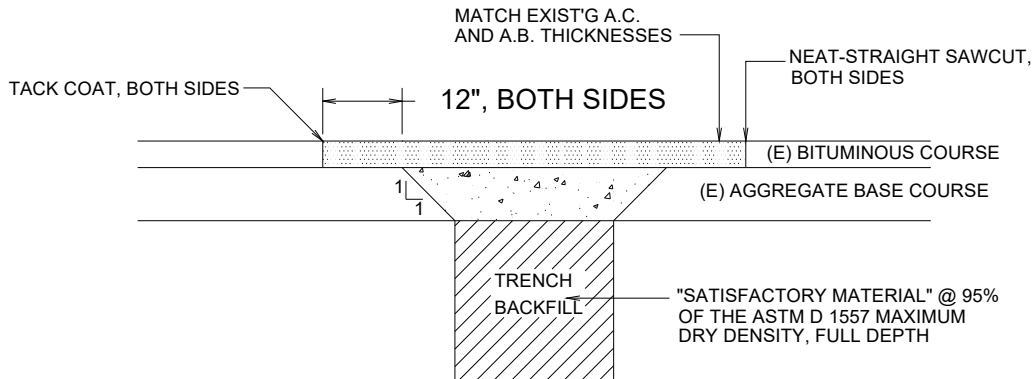


Figure 1: Typical utility trench pavement repair detail

## 6. EARTHWORK

Specification Section 31 00 00 will be edited by Soil Design to incorporate the following requirements. Satisfactory material for fill and backfill at buildings, and pavements should be classified per ASTM D 2487 as GW, GC, GM, SW, SC, SM, or any combination thereof. The preceding materials, and CL material except at buildings and pavements, qualify as satisfactory material for general grading areas, and for final backfill of trenches as further discussed below. Materials not meeting these classifications will be defined as unsatisfactory, which would also

include organics, trash or debris. Following necessary stripping/demolition/excavation, the exposed surface shall be scarified to a depth of 6 inches, moisture-conditioned, and compacted to at least 95% or 90% of laboratory maximum density for cohesionless or cohesive materials, respectively. As stated earlier, only "Select Granular Material" (as defined in UFGS Section 31 00 00) compacted to 95% of laboratory maximum shall be used for fill beneath buildings. Laboratory maximum density refers to ASTM D 1557, also known as "Modified Proctor", which shall be used for all project work; **ASTM D 698 (Standard Proctor) shall be stricken from all project specifications.** Satisfactory materials placed as fill below buildings and pavements, shall be moisture conditioned and compacted to at least 95%/90% for cohesionless/cohesive materials. All fill materials shall be specified to be placed in maximum 8-inch loose or 6-inch compacted thickness lifts, except maximum 4-inch compacted thickness shall be specified for layers compacted with hand-operated equipment.

## 7. TRENCHING AND BACKFILLING

### 7.1 General

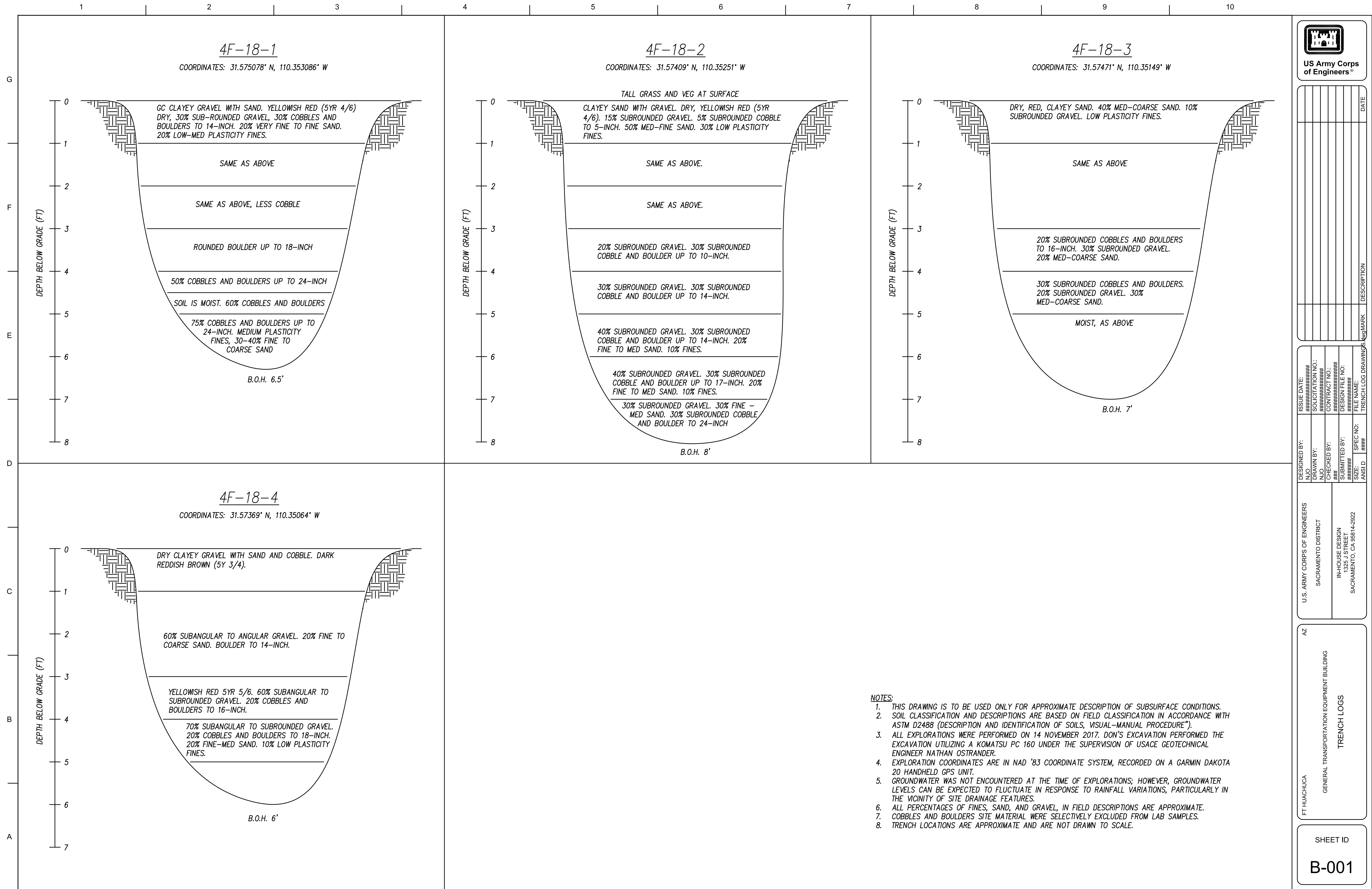
Trench and backfill underground utilities in accordance with manufacturer's specification for the particular conduit type, coating type, and loading condition. In the absence of manufacturer's specifications, we recommend the use of granular ("select granular material", or ASTM C33 size No. 67 (or finer) concrete course aggregate) bedding and granular initial backfill to support the conduit and prevent point bearing. The remainder of the trench shall be backfilled with "satisfactory material" and compacted full depth to 95% laboratory maximum in building and paved areas, and to 90% laboratory maximum in open areas. All fill materials shall be specified to be placed with lift thicknesses per previous paragraph.

## 8. REFERENCES

- ADOT, Report Number: AZ92-344 Development of Seismic Acceleration Contour Maps for Arizona prepared by Geological Consultants, September 1992.
- ASCE/SEI 7-16, *Minimum Design Loads for Buildings and Other Structures*, American Society of Civil Engineers, 2016
- Das, Braja M., *Principles of Foundation Engineering*, Third Edition, PWS Publishing Company, Boston, MA, 1995.
- EM 1110-1-1904, Settlement, 30 September 1990
- EM 1110-1-1905, Bearing Capacity of Soils, 30 October 1992
- 2015 International Building Code, Section 1613, *Earthquake Loads – Seismic Ground Motion Values*.
- UFC 3-250-01, Pavement Design for Roads, Streets, Walks, and Open Storage Areas, October 2011 (draft) (used by PCASE Program).

APPENDIX A

LOGS OF EXPLORATIONS



**NOTES:**

- 1. THIS DRAWING IS TO BE USED ONLY FOR APPROXIMATE DESCRIPTION OF SUBSURFACE CONDITIONS.
- 2. SOIL CLASSIFICATION AND DESCRIPTIONS ARE BASED ON FIELD CLASSIFICATION IN ACCORDANCE WITH ASTM D2488 (DESCRIPTION AND IDENTIFICATION OF SOILS, VISUAL-MANUAL PROCEDURE).
- 3. ALL EXPLORATIONS WERE PERFORMED ON 14 NOVEMBER 2017. DON'S EXCAVATION PERFORMED THE EXCAVATION UTILIZING A KOMATSU PC 160 UNDER THE SUPERVISION OF USACE GEOTECHNICAL ENGINEER NATHAN OSTRANDER.
- 4. EXPLORATION COORDINATES ARE IN NAD '83 COORDINATE SYSTEM, RECORDED ON A GARMIN DAKOTA 20 HANDHELD GPS UNIT.
- 5. GROUNDWATER WAS NOT ENCOUNTERED AT THE TIME OF EXPLORATIONS; HOWEVER, GROUNDWATER LEVELS CAN BE EXPECTED TO FLUCTUATE IN RESPONSE TO RAINFALL VARIATIONS, PARTICULARLY IN THE VICINITY OF SITE DRAINAGE FEATURES.
- 6. ALL PERCENTAGES OF FINES, SAND, AND GRAVEL, IN FIELD DESCRIPTIONS ARE APPROXIMATE.
- 7. COBBLES AND BOULDERS SITE MATERIAL WERE SELECTIVELY EXCLUDED FROM LAB SAMPLES.
- 8. TRENCH LOCATIONS ARE APPROXIMATE AND ARE NOT DRAWN TO SCALE.

**US Army Corps of Engineers**

NO.	DATE	DESCRIPTION

DESIGNED BY: NO. #	ISSUE DATE: #####
DRAWN BY: NO. #	SOLICITATION NO.: #####
CHECKED BY: NO. #	CONTRACT NO.: #####
SUBMITTED BY: NO. #	DESIGN FILE NO.: #####
SIZE: ###	FILE NAME: #####
ANSID: ###	TRENCH LOG DRAWINGS: #####

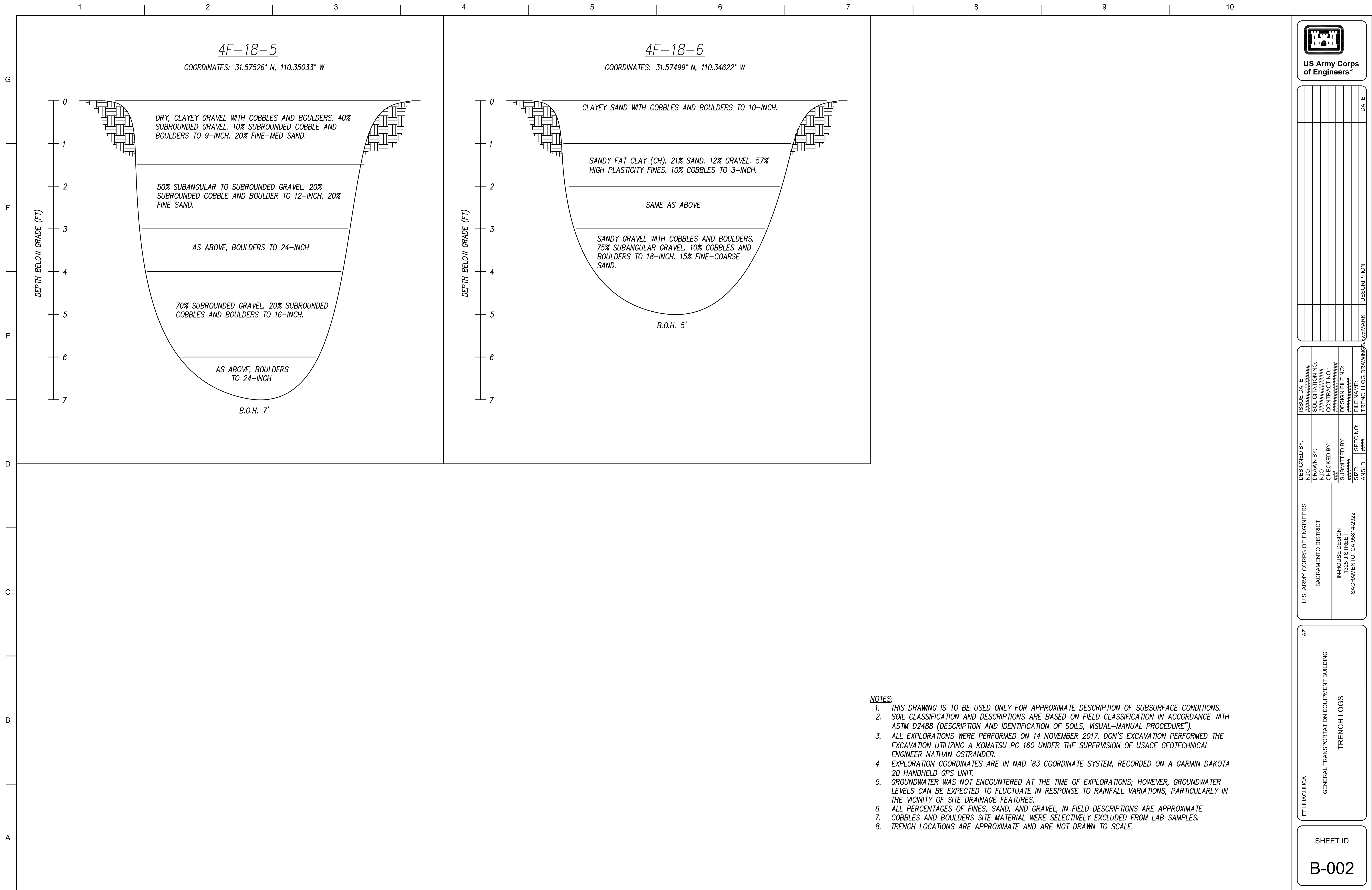
U.S. ARMY CORPS OF ENGINEERS  
SACRAMENTO DISTRICT

IN-HOUSE DESIGN  
1325 J STREET  
SACRAMENTO, CA 95814-2922

AZ  
GENERAL TRANSPORTATION EQUIPMENT BUILDING  
TRENCH LOGS  
FT HUACHUCA

SHEET ID  
**B-001**





- NOTES:**
1. THIS DRAWING IS TO BE USED ONLY FOR APPROXIMATE DESCRIPTION OF SUBSURFACE CONDITIONS.
  2. SOIL CLASSIFICATION AND DESCRIPTIONS ARE BASED ON FIELD CLASSIFICATION IN ACCORDANCE WITH ASTM D2488 (DESCRIPTION AND IDENTIFICATION OF SOILS, VISUAL-MANUAL PROCEDURE).
  3. ALL EXPLORATIONS WERE PERFORMED ON 14 NOVEMBER 2017. DON'S EXCAVATION PERFORMED THE EXCAVATION UTILIZING A KOMATSU PC 160 UNDER THE SUPERVISION OF USACE GEOTECHNICAL ENGINEER NATHAN OSTRANDER.
  4. EXPLORATION COORDINATES ARE IN NAD '83 COORDINATE SYSTEM, RECORDED ON A GARMIN DAKOTA 20 HANDHELD GPS UNIT.
  5. GROUNDWATER WAS NOT ENCOUNTERED AT THE TIME OF EXPLORATIONS; HOWEVER, GROUNDWATER LEVELS CAN BE EXPECTED TO FLUCTUATE IN RESPONSE TO RAINFALL VARIATIONS, PARTICULARLY IN THE VICINITY OF SITE DRAINAGE FEATURES.
  6. ALL PERCENTAGES OF FINES, SAND, AND GRAVEL, IN FIELD DESCRIPTIONS ARE APPROXIMATE.
  7. COBBLES AND BOULDERS SITE MATERIAL WERE SELECTIVELY EXCLUDED FROM LAB SAMPLES.
  8. TRENCH LOCATIONS ARE APPROXIMATE AND ARE NOT DRAWN TO SCALE.

**US Army Corps of Engineers**

ISSUE DATE: #####	DESIGNED BY: NO. #####	U.S. ARMY CORPS OF ENGINEERS	AZ
SOLICITATION NO.: #####	DRAWN BY: NO. #####	SACRAMENTO DISTRICT	GENERAL TRANSPORTATION EQUIPMENT BUILDING
CONTRACT NO.: ###	CHECKED BY: ###	IN-HOUSE DESIGN 1325 J STREET SACRAMENTO, CA 95814-2922	TRENCH LOGS
DESIGN FILE NO.: #####	SUBMITTED BY: #####		
FILE NAME: #####	SIZE: ###		
TRENCH LOG DRAWINGS	SPEC NO.: ###		
MARK	DESCRIPTION		
DATE			

SHEET ID  
**B-002**

APPENDIX B

SUMMARY OF SOILS

LABORATORY TEST RESULTS



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**LABORATORY REPORT  
ON SOIL**

Client **U.S. ARMY CORPS OF ENGINEERS – SACRAMENTO DISTRICT**  
**SOIL DESIGN SECTION B**  
**1325 J STREET**  
**SACRAMENTO, CA 95814**

Date of Report **12-15-17**  
Job No. **2147JL301**  
Event / Invoice No. **K301-001** Lab No. **82787**  
Authorized By **IORELLA J FUENTES** Date **11-14-17**  
Sampled By **CLIENT** Date **11-14-17**  
Submitted By **CLIENT** Date **11-14-17**

Project **LABORATORY TESTING SERVICES**  
Contractor --  
Type / Use of Material **SUBGRADE**  
Sample Source / Location **4F-18-1**

Location **VARIOUS**  
Arch. / Engr. --  
Supplier / Source **PROJECT SITE**  
Source / Location Desig. By **CLIENT** Date **11-14-17**

Reference: **PARTICLE SIZE ANALYSIS OF SOIL**  **ASTM D422**  **AASHTO T88**  
**HYDRAULIC CONDUCTIVITY**  **ASTM D5084 METHOD**  **ASTM D2434**

Special Instructions:

**TEST RESULTS**

<b>PARTICLE SIZE ANALYSIS</b>		DISPERSION DEVICE <b>1</b>		LENGTH OF DISPERSION PERIOD, MINUTES <b>2</b>	SPECIFIC GRAVITY → <b>2.609</b>	<input checked="" type="checkbox"/> ASTM D854
DIFFICULTY IN DISPERSING MINUS NO. 10 MATERIAL						<input type="checkbox"/> ASSUMED
DESCRIPTION OF SAND & GRAVEL PARTICLES:		<input checked="" type="checkbox"/> HARD	<input type="checkbox"/> SOFT	<input type="checkbox"/> FRIABLE	<input type="checkbox"/> ROUNDED	<input type="checkbox"/> ANGULAR
						MAXIMUM PARTICLE SIZE, IN. <b>2</b>
SIEVE ANALYSIS		HYDROMETER ANALYSIS		LIQUID & PLASTIC PROPERTIES		
SIEVE SIZE	% PASS	PARTICLE SIZE	% PASS	<input checked="" type="checkbox"/> ASTM D4318	<input type="checkbox"/> AASHTO T89 & T90	
3 IN.	<b>95</b>	0.074 MM	<b>19.9</b>	METHOD <input checked="" type="checkbox"/> A <input type="checkbox"/> B		RESULT SPECIFICATION
2 IN.	<b>86</b>			LIQUID LIMIT		<b>30</b>
1 1/2 IN.	<b>82</b>	0.020 MM	<b>17.5</b>	PLASTIC LIMIT		<b>13</b>
1 IN.	<b>75</b>			PLASTICITY INDEX		<b>17</b>
3/4	<b>72</b>	0.005 MM	<b>13.7</b>	SAMPLE AIR DRIED: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
3/8	<b>65</b>			ESTIMATE % RETAINED ON NO. 40		
NO. 4	<b>58</b>	0.002 MM	<b>12.0</b>			
8	<b>50</b>					
10	<b>48</b>	0.001 MM	<b>10.8</b>			
40	<b>34.4</b>			<b>SOIL CLASSIFICATION</b>		
50	<b>31.2</b>			<input checked="" type="checkbox"/> ASTM D2487	<input type="checkbox"/> AASHTO M145	
200	<b>19.9</b>			<input type="checkbox"/> ASTM D2488 VISUAL / MANUAL		
				GROUP SYMBOL <b>GC</b>		
				GROUP NAME <b>CLAYEY GRAVEL WITH SAND</b>		

**HYDRAULIC CONDUCTIVITY**

SPECIMEN CHARACTERISTIC							
INITIAL	HEIGHT, IN.	DIAMETER, IN.	DENSITY, PCF	MOISTURE, %	VOID RATIO	SATURATION, %	TYPE
FINAL							<input type="checkbox"/> REMOLDED <input type="checkbox"/> UNDISTURBED
	SPECIFIC GRAVITY → <input type="checkbox"/> ASTM D854 <input type="checkbox"/> ASSUMED		MAXIMUM CONSOLIDATION EFFECTIVE STRESS, PSI →				
	PERMEANT		MINIMUM CONSOLIDATION EFFECTIVE STRESS, PSI →				
	TOTAL BACK PRESSURE, PSI →		HYDRAULIC GRADIENT →				
			HYDRAULIC CONDUCTIVITY, CM PER SECOND →				

Comments: **GRAVEL = 42.0%, SAND = 38.1%, SILT = 6.2%, CLAY = 13.7%, COLLOIDS = 10.8%**

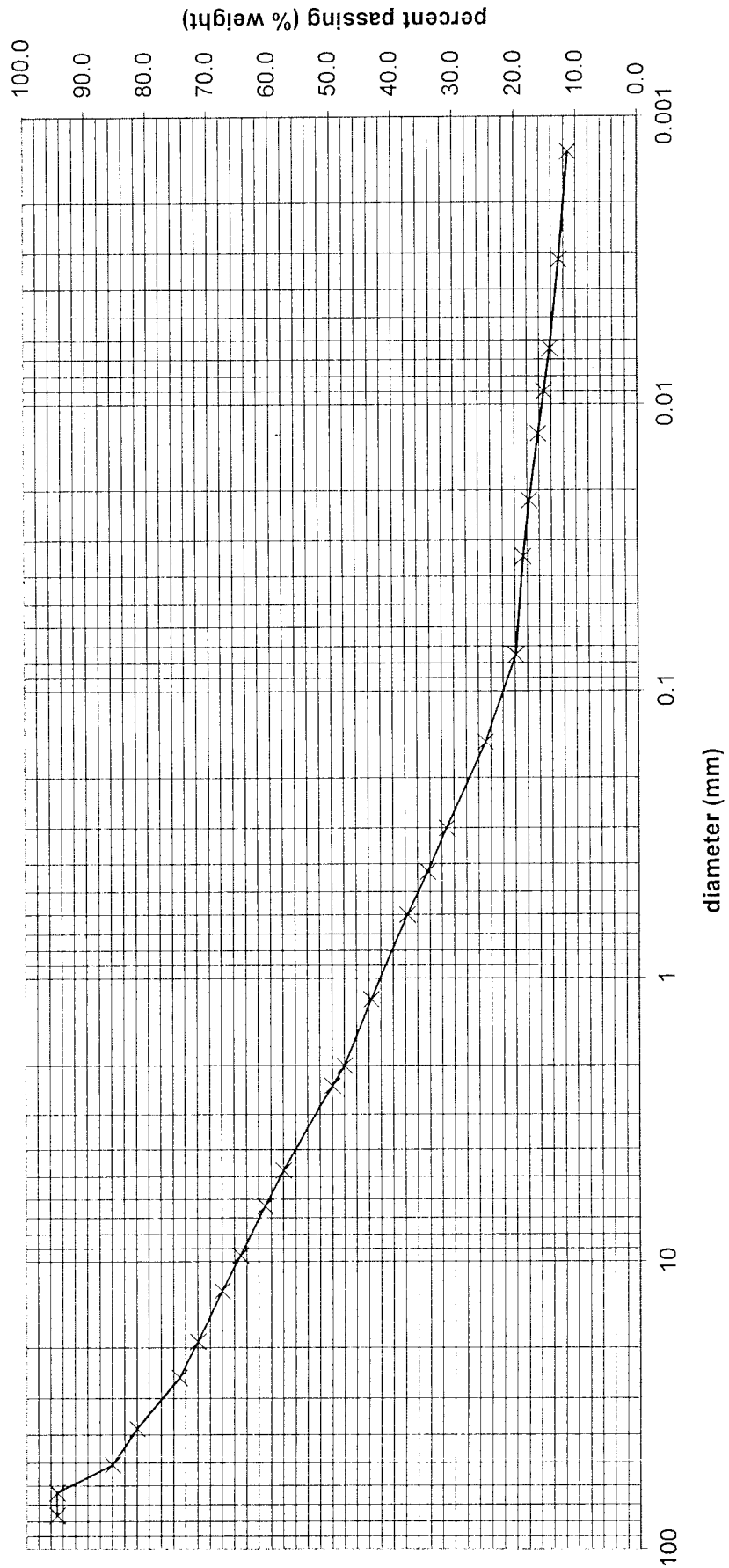
Copies To: **CLIENT – (1) EMAIL**

THE SERVICES REFERRED TO HEREIN WERE PERFORMED IN ACCORDANCE WITH THE STANDARD OF CARE PRACTICED LOCALLY FOR THE REFERENCED METHOD(S) AND RELATE ONLY TO THE CONDITION(S) OR SAMPLE(S) TESTED AS STATED HEREIN. WESTERN TECHNOLOGIES INC. MAKES NO OTHER WARRANTY OR REPRESENTATION, EXPRESSED OR IMPLIED, AND HAS NOT CONFIRMED INFORMATION INCLUDING SOURCE OF MATERIALS SUBMITTED BY OTHERS.

REVIEWED BY *[Signature]* 12-15-17



WT Project No. 2147JL301  
Event 1  
Lab no. 82787





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Phoenix, Arizona 85040-2921  
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**LABORATORY REPORT  
ON SOIL**

Client **U.S. ARMY CORPS OF ENGINEERS – SACRAMENTO DISTRICT**  
**SOIL DESIGN SECTION B**  
**1325 J STREET**  
**SACRAMENTO, CA 95814**

Date of Report **12-15-17**  
Job No. **2147JL301**  
Event / Invoice No. **K301-001** Lab No. **82788**  
Authorized By **IORELLA J FUENTES** Date **11-14-17**  
Sampled By **CLIENT** Date **11-14-17**  
Submitted By **CLIENT** Date **11-14-17**

Project **LABORATORY TESTING SERVICES**

Location **VARIOUS**

Contractor **--**

Arch. / Engr. **--**

Type / Use of Material **SUBGRADE**

Supplier / Source **PROJECT SITE**

Sample Source / Location **4F-18-6**

Source / Location Desig. By **CLIENT**

Date **11-14-17**

Reference: **PARTICLE SIZE ANALYSIS OF SOIL**  **ASTM D422**  **AASHTO T88**  
**HYDRAULIC CONDUCTIVITY**  **ASTM D5084 METHOD**  **ASTM D2434**

Special Instructions:

**TEST RESULTS**

<b>PARTICLE SIZE ANALYSIS</b>		DISPERSION DEVICE <b>1</b>		LENGTH OF DISPERSION PERIOD, MINUTES <b>2</b>	SPECIFIC GRAVITY → <b>2.670</b>	<input checked="" type="checkbox"/> <b>ASTM D854</b>
DIFFICULTY IN DISPERSING MINUS NO. 10 MATERIAL		<input checked="" type="checkbox"/> <b>HARD</b> <input type="checkbox"/> <b>SOFT</b> <input type="checkbox"/> <b>FRIABLE</b> <input type="checkbox"/> <b>ROUNDED</b> <input type="checkbox"/> <b>ANGULAR</b>		MAXIMUM PARTICLE SIZE, IN. <b>2</b>		<input type="checkbox"/> <b>ASSUMED</b>
DESCRIPTION OF SAND & GRAVEL PARTICLES:						
<b>SIEVE ANALYSIS</b>		<b>HYDROMETER ANALYSIS</b>		<b>LIQUID &amp; PLASTIC PROPERTIES</b>		
SIEVE SIZE	% PASS	PARTICLE SIZE	% PASS	<input checked="" type="checkbox"/> <b>ASTM D4318</b> <input type="checkbox"/> <b>AASHTO T89 &amp; T90</b>	METHOD <input checked="" type="checkbox"/> <b>A</b> <input type="checkbox"/> <b>B</b>	RESULT
3 IN.	<b>100</b>	0.074 MM	<b>59.6</b>			SPECIFICATION
2 IN.	<b>95</b>					<b>60</b>
1 1/2 IN.	<b>94</b>	0.020 MM	<b>58.9</b>			<b>23</b>
1 IN.	<b>93</b>					<b>37</b>
3/4	<b>93</b>	0.005 MM	<b>53.5</b>			
3/8	<b>90</b>					
NO. 4	<b>87</b>	0.002 MM	<b>50.9</b>	SAMPLE AIR DRIED: <input checked="" type="checkbox"/> <b>YES</b> <input type="checkbox"/> <b>NO</b>		
8	<b>84</b>			ESTIMATE % RETAINED ON NO. 40		
10	<b>83</b>	0.001 MM	<b>48.3</b>	<b>SOIL CLASSIFICATION</b>		
40	<b>72.7</b>			<input checked="" type="checkbox"/> <b>ASTM D2487</b> <input type="checkbox"/> <b>AASHTO M145</b>		
50	<b>70.0</b>			<input type="checkbox"/> <b>ASTM D2488 VISUAL / MANUAL</b>		
200	<b>59.6</b>			GROUP SYMBOL <b>CH</b>		
				GROUP NAME <b>SANDY FAT CLAY</b>		

<b>HYDRAULIC CONDUCTIVITY</b>							
				<b>SPECIMEN CHARACTERISTIC</b>			
	HEIGHT, IN.	DIAMETER, IN.	DENSITY, PCF	MOISTURE, %	VOID RATIO	SATURATION, %	TYPE
INITIAL							REMOVED
FINAL							UNDISTURBED
SPECIFIC GRAVITY →		<input type="checkbox"/> <b>ASTM D854</b>		MAXIMUM CONSOLIDATION EFFECTIVE STRESS, PSI →			
		<input type="checkbox"/> <b>ASSUMED</b>		MINIMUM CONSOLIDATION EFFECTIVE STRESS, PSI →			
PERMEANT				HYDRAULIC GRADIENT →			
TOTAL BACK PRESSURE, PSI →				HYDRAULIC CONDUCTIVITY, CM PER SECOND →			

Comments: **GRAVEL = 13.0%, SAND = 27.4%, SILT = 6.0%, CLAY = 53.5%, COLLOIDS = 48.3%**

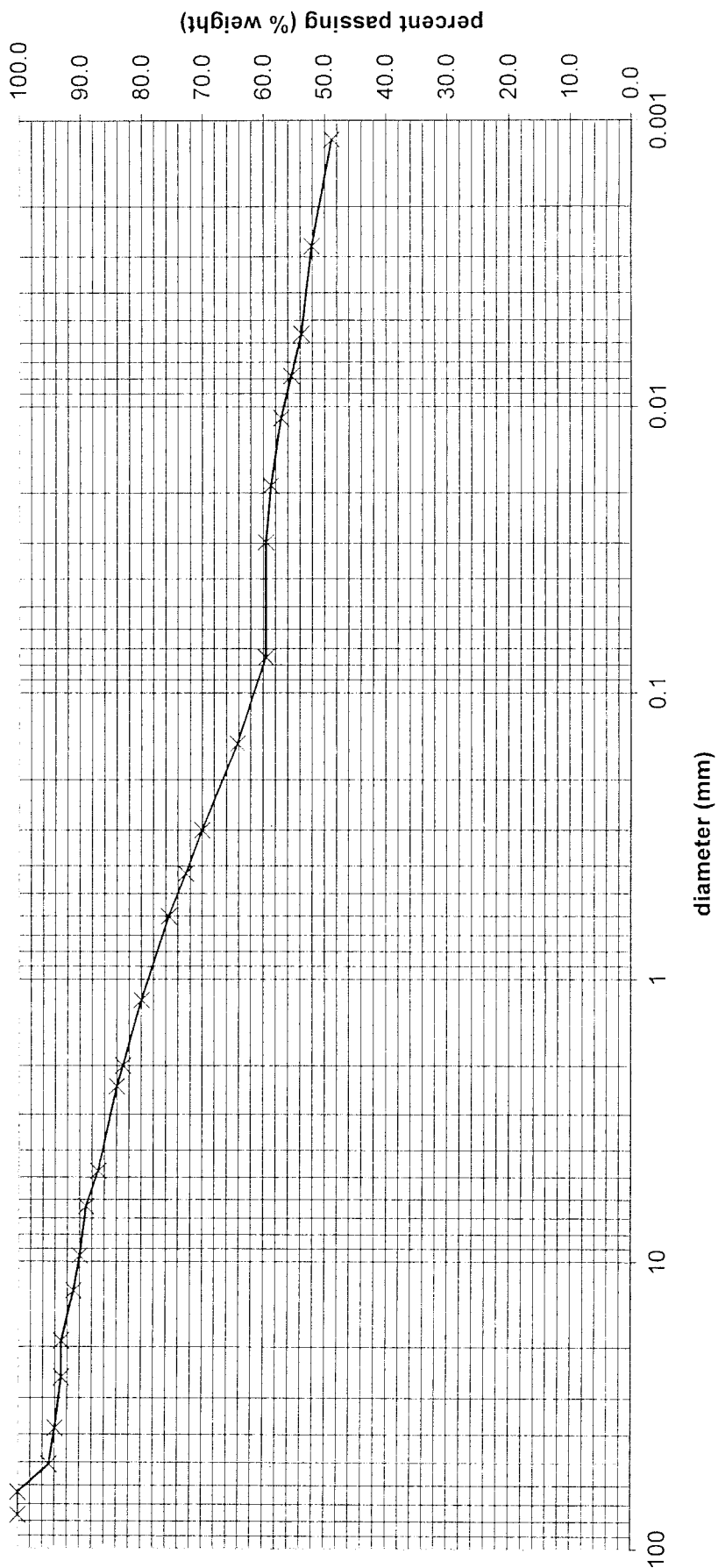
Copies To: **CLIENT – (1) EMAIL**

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REVIEWED BY *[Signature]* **12-15-17**



WT Project No. 2147JL301  
Event K301-001  
Lab No. 82788





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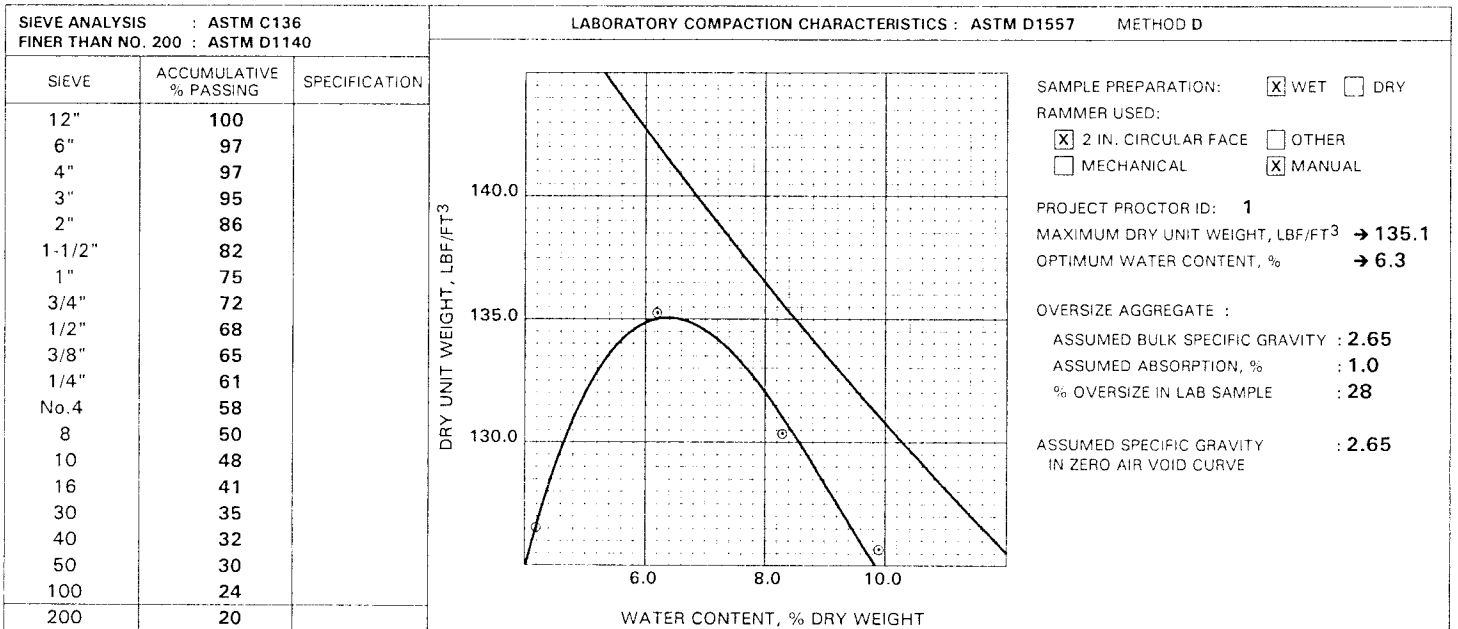
**PHYSICAL PROPERTIES  
OF SOILS & AGGREGATES**

Client **U.S. ARMY CORPS OF ENGINEERS - SACRAMENTO DISTRICT  
SOIL DESIGN SECTION B  
1325 J STREET  
SACRAMENTO, CA 95814**

Date of Report **12-15-17**  
Job No. **2147JL301**  
Event / Invoice No. **K301-001** Lab No. **82787**  
Authorized by **IORELLA J FUENTES** Date **11-14-17**  
Sampled by **CLIENT** Date **11-14-17**  
Submitted by **CLIENT** Date **11-14-17**  
Source / Location Designated by **CLIENT** Date **11-14-17**

Project **LABORATORY TESTING SERVICES**  
Location **VARIOUS**  
Type / Use of Material **SUBGRADE**  
Supplier / Source **PROJECT SITE**  
Sample Source / Location **4F-18-1**  
Special Instructions **ROCK REPLACEMENT METHOD USED FOR ASTM D1557**

**TEST RESULTS**



TEST PROCEDURE	RESULT	SPECS	TEST PROCEDURE	RESULT	SPECS
<b>LIQUID &amp; PLASTIC PROPERTIES : ASTM D4318</b>			<b>RESISTANCE TO DEGRADATION OF SMALL-SIZE COARSE AGGREGATES BY ABRASION :</b>		
METHOD A	LIQUID LIMIT →	30	GRADING 100 REV, % LOSS →		
ESTIMATED % RETAINED ON NO. 40	PLASTIC LIMIT →	13	GRADING 500 REV, % LOSS →		
SAMPLE AIR DRIED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	PLASTICITY INDEX →	17			
<b>MOISTURE CONTENT :</b>			<b>SPECIFIC GRAVITY :</b>		
PORTION TESTED	% DRY WEIGHT →		MAX. PARTICLE SIZE, IN.	SPECIFIC GRAVITY @ 20°C →	
<b>EXPANSION / COMPRESSION PROPERTIES OF COHESIVE SOIL :</b>			<b>pH DETERMINATION :</b>		
<input type="checkbox"/> EXPANSION <input type="checkbox"/> COMPRESSION, % →				pH →	
SURCHARGE, PSF	MAXIMUM SWELL PRESSURE, KSF →		<b>SOLUBLE SALTS :</b>		
INITIAL WATER CONTENT, %	DRY UNIT WEIGHT LBF/FT <sup>3</sup>			PPM →	
<b>EXPANSION INDEX OF SOIL :</b>			<b>MINIMUM RESISTIVITY :</b>		
INITIAL WATER CONTENT, %				OHM-CM →	
INITIAL DRY UNIT WEIGHT LBF/FT <sup>3</sup>	EI →		<b>SOIL CLASSIFICATION : ASTM D2487 GROUP SYMBOL: GC</b>		
INITIAL DEGREE OF SATURATION			NAME: <b>CLAYEY GRAVEL WITH SAND</b>		
FINAL WATER CONTENT, %					

Comments :

Copies to : CLIENT (1)

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**PHYSICAL PROPERTIES  
OF SOILS & AGGREGATES**

Client **U.S. ARMY CORPS OF ENGINEERS - SACRAMENTO DISTRICT**  
**SOIL DESIGN SECTION B**  
**1325 J STREET**  
**SACRAMENTO, CA 95814**

Date of Report **12-15-17**  
Job No. **2147JL301**  
Event / Invoice No. **K301-001** Lab No. **82788**  
Authorized by **IORELLA J FUENTES** Date **11-14-17**  
Sampled by **CLIENT** Date **11-14-17**  
Submitted by **CLIENT** Date **11-14-17**  
Source / Location Designated by **CLIENT** Date **11-14-17**

Project **LABORATORY TESTING SERVICES**  
Location **VARIOUS**  
Type / Use of Material **SUBGRADE**  
Supplier / Source **PROJECT SITE**  
Sample Source / Location **4F-18-6**  
Special Instructions **ROCK REPLACEMENT METHOD USED FOR ASTM D1557**

**TEST RESULTS**

SIEVE ANALYSIS : ASTM C136 FINER THAN NO. 200 : ASTM D1140			LABORATORY COMPACTION CHARACTERISTICS : ASTM D1557 METHOD D		
SIEVE	ACCUMULATIVE % PASSING	SPECIFICATION			
6"					
4"					
3"	100				
2"	95				
1-1/2"	94				
1"	93				
3/4"	93				
1/2"	91				
3/8"	90				
1/4"	89				
No.4	87				
8	84				
10	83				
16	80				
30	76				
40	74				
50	72				
100	67				
200	63				

TEST PROCEDURE		RESULT	SPECS	TEST PROCEDURE		RESULT	SPECS
LIQUID & PLASTIC PROPERTIES : ASTM D4318				RESISTANCE TO DEGRADATION OF SMALL-SIZE COARSE AGGREGATES BY ABRASION :			
METHOD A	LIQUID LIMIT →	60		GRADING 100 REV, % LOSS →			
ESTIMATED % RETAINED ON NO. 40	26	PLASTIC LIMIT →	23	GRADING 500 REV, % LOSS →			
SAMPLE AIR DRIED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		PLASTICITY INDEX →	37				
MOISTURE CONTENT :				SPECIFIC GRAVITY :			
PORTION TESTED	% DRY WEIGHT →			MAX. PARTICLE SIZE, IN.	SPECIFIC GRAVITY @ 20°C →		
EXPANSION / COMPRESSION PROPERTIES OF COHESIVE SOIL :				pH DETERMINATION :			
<input type="checkbox"/> EXPANSION <input type="checkbox"/> COMPRESSION, % →				pH →			
SURCHARGE, PSF				SOLUBLE SALTS :			
INITIAL WATER CONTENT, %				PPM →			
DRY UNIT WEIGHT LBF/FT <sup>3</sup>				MINIMUM RESISTIVITY :			
EXPANSION INDEX OF SOIL :				OHM-CM →			
INITIAL WATER CONTENT, %		EI →		SOIL CLASSIFICATION : ASTM D2487 GROUP SYMBOL: CH			
INITIAL DRY UNIT WEIGHT LBF/FT <sup>3</sup>				NAME: SANDY FAT CLAY			
INITIAL DEGREE OF SATURATION							
FINAL WATER CONTENT, %							

Comments :

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**CALIFORNIA BEARING RATIO  
(CBR)**

Client **U.S. ARMY CORP OF ENGINEERS – SACRAMENTO DISTRICT**  
**SOIL DESIGN SECTION B**  
**1325 J STREET**  
**SACRAMENTO, CA 95814**

Date of Report **12-15-17**  
Job No. **2147JL301**  
Event / Invoice No. **K301-001** Lab No. **82788**  
Authorized By **IORELL J FUENTES** Date **11-14-17**  
Sampled By **CLIENT** Date **11-14-17**  
Submitted By **CLIENT** Date **11-14-17**

Project **LABORATORY TESTING SERVICES**

Location **VARIOUS**

Type / Use of Material **SUBGRADE**

Supplier / Source **PROJECT SITE**

Sample Source / Location **4F-18-6**

Source / Location Desig. By **CLIENT**

Date **11-14-17**

Testing Authorized **ROCK REPLACEMENT METHOD USED PER ASTM D1883**

**TEST RESULTS**

LABORATORY COMPACTION CHARACTERISTICS  ASTM D698  AASHTO T99  ASTM D1557  AASHTO T180 METHOD **D**

MAXIMUM DRY DENSITY, PCF **111.3**

OPTIMUM MOISTURE, % **15.8**

**BEARING RATIO OF LABORATORY-COMPACTED SPECIMENS, ASTM D1883**

COMPACTIVE EFFORT, BLOWS PER LAYER	<b>7</b>	<b>20</b>	<b>56</b>
DRY DENSITY AT COMPACTION, PCF	<b>91.0</b>	<b>102.3</b>	<b>110.6</b>
PERCENT OF MAXIMUM DRY DENSITY, %	<b>81.8</b>	<b>91.9</b>	<b>99.4</b>
MOISTURE BEFORE COMPACTION, %	<b>17.1</b>	<b>16.7</b>	<b>16.6</b>
MOISTURE AFTER COMPACTION, %	<b>15.8</b>	<b>16.8</b>	<b>16.9</b>
DRY DENSITY AFTER SOAKING, PCF	<b>92.0</b>	<b>102.8</b>	<b>111.2</b>
MOISTURE AFTER SOAKING (TOP ONE INCH), %	<b>27.4</b>	<b>25.3</b>	<b>24.1</b>
MOISTURE AFTER SOAKING (AVERAGE OF TOTAL SAMPLE), %	<b>27.1</b>	<b>23.2</b>	<b>20.0</b>
SWELL, %	<b>2.3</b>	<b>3.1</b>	<b>1.1</b>
CALIFORNIA BEARING RATIO AT 0.100 INCH PENETRATION	<b>2</b>	<b>5</b>	<b>7</b>
CALIFORNIA BEARING RATIO AT 0.200 INCH PENETRATION	<b>2</b>	<b>4</b>	<b>6</b>
SURCHARGE WEIGHT, LBS.	<b>15</b>	<b>15</b>	<b>15</b>
PERCENT OF PLUS 19 MM MATERIAL, %	<b>7</b>	<b>7</b>	<b>7</b>

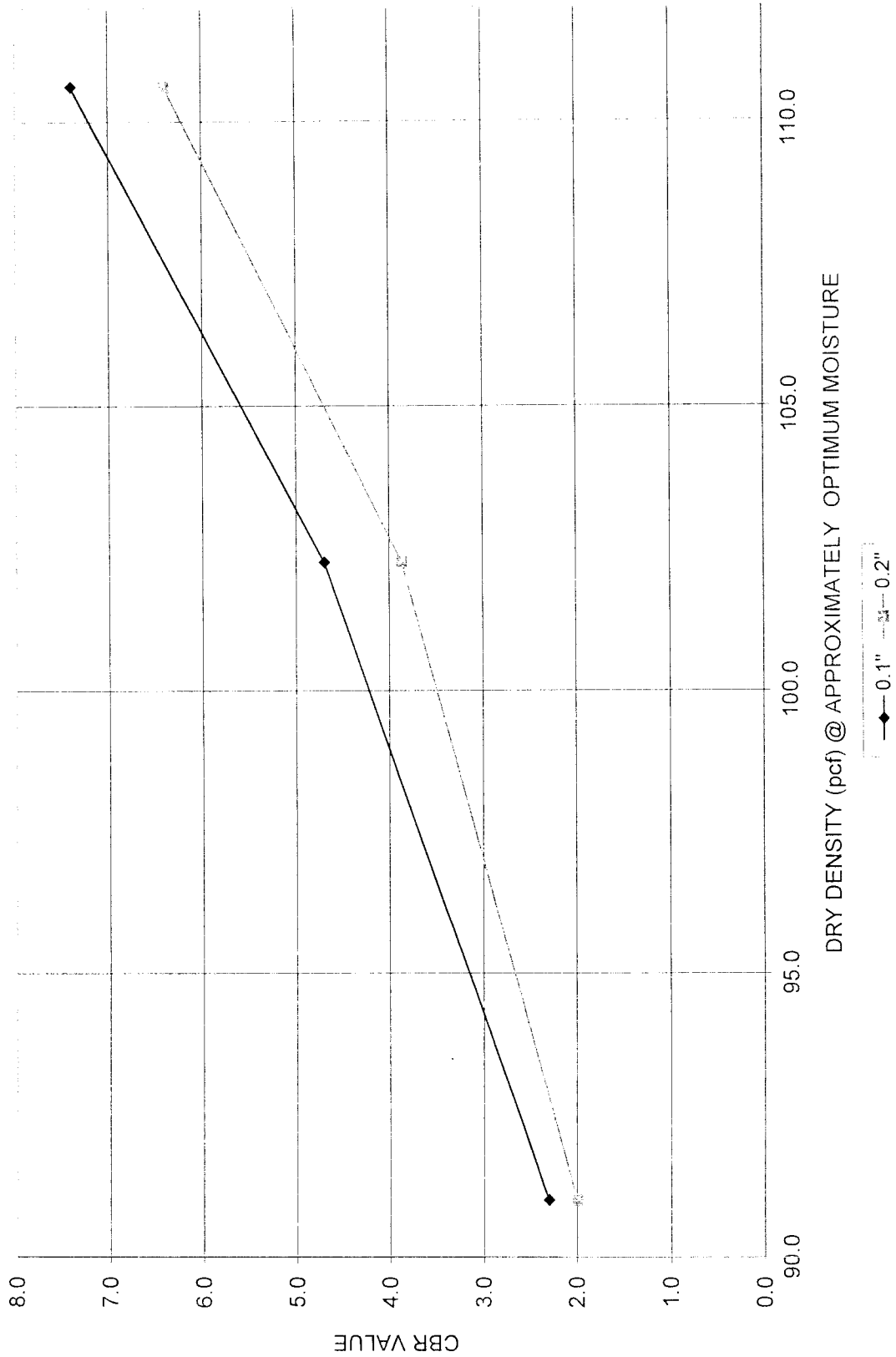
Comments:

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WT Project 2147JL301  
Event 1  
Lab No. 82788





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**PHYSICAL PROPERTIES  
OF SOILS & AGGREGATES**

Client **U.S. ARMY CORPS OF ENGINEERS - SACRAMENTO DISTRICT**  
**SOIL DESIGN SECTION B**  
**1325 J STREET**  
**SACRAMENTO, CA 95814**

Date of Report **12-15-17**  
Job No. **2147JL301**  
Event / Invoice No. **K301-001** Lab No. **82789**  
Authorized by **IORELLA J FUENTES** Date **11-14-17**  
Sampled by **CLIENT** Date **11-14-17**  
Submitted by **CLIENT** Date **11-14-17**  
Source / Location Designated by **CLIENT** Date **11-14-17**

Project **LABORATORY TESTING SERVICES**  
Location **VARIOUS**  
Type / Use of Material **SUBGRADE**  
Supplier / Source **PROJECT SITE**  
Sample Source / Location **4F-18-2**  
Special Instructions

**TEST RESULTS**

SIEVE ANALYSIS : FINER THAN NO. 200 :			LABORATORY COMPACTION CHARACTERISTICS :				METHOD	
SIEVE	ACCUMULATIVE % PASSING	SPECIFICATION					SAMPLE PREPARATION: <input type="checkbox"/> WET <input type="checkbox"/> DRY	
							RAMMER USED:	
							<input type="checkbox"/> 2 IN. CIRCULAR FACE	<input type="checkbox"/> OTHER
							<input type="checkbox"/> MECHANICAL	<input type="checkbox"/> MANUAL
							MAXIMUM DRY UNIT WEIGHT, LBF/FT <sup>3</sup> →	
			OPTIMUM WATER CONTENT, % →		OVERSIZE AGGREGATE :			
			BULK SPECIFIC GRAVITY :		ABSORPTION, % :			
			% OVERSIZE IN LAB SAMPLE :		SPECIFIC GRAVITY IN ZERO AIR VOID CURVE :			
			WATER CONTENT, % DRY WEIGHT					
TEST PROCEDURE			RESULT	SPECS	TEST PROCEDURE		RESULT	SPECS
<b>LIQUID &amp; PLASTIC PROPERTIES :</b>					<b>RESISTANCE TO DEGRADATION OF SMALL-SIZE COARSE AGGREGATES BY ABRASION :</b>			
ESTIMATED % RETAINED ON NO. 40			LIQUID LIMIT →		GRADING 100 REV. % LOSS →			
SAMPLE AIR DRIED <input type="checkbox"/> YES <input type="checkbox"/> NO			PLASTIC LIMIT →		GRADING 500 REV. % LOSS →			
			PLASTICITY INDEX →		<b>SPECIFIC GRAVITY :</b>			
<b>MOISTURE CONTENT :</b>					MAX. PARTICLE SIZE, IN.		SPECIFIC GRAVITY @ 20°C →	
PORTION TESTED			% DRY WEIGHT →		pH DETERMINATION : AZ 237			
<b>EXPANSION / COMPRESSION PROPERTIES OF COHESIVE SOIL :</b>					pH → <b>7.2</b>			
<input type="checkbox"/> EXPANSION <input type="checkbox"/> COMPRESSION, % →					<b>SOLUBLE SALTS :</b>			
SURCHARGE, PSF			MAXIMUM SWELL PRESSURE, KSF →		PPM →			
INITIAL WATER CONTENT, %			DRY UNIT WEIGHT LBF/FT <sup>3</sup>		<b>MINIMUM RESISTIVITY : AZ 236</b>			
<b>EXPANSION INDEX OF SOIL :</b>					OHM-CM →		<b>1934</b>	
INITIAL WATER CONTENT, % :					<b>SOIL CLASSIFICATION :</b>			
INITIAL DRY UNIT WEIGHT LBF/FT <sup>3</sup> :			EI →		GROUP SYMBOL:			
INITIAL DEGREE OF SATURATION :					NAME:			
FINAL WATER CONTENT, % :								

Comments :

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REVIEWED BY 12-15-17



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**PHYSICAL PROPERTIES  
OF SOILS & AGGREGATES**

Client **U.S. ARMY CORPS OF ENGINEERS - SACRAMENTO DISTRICT**  
**SOIL DESIGN SECTION B**  
**1325 J STREET**  
**SACRAMENTO, CA 95814**

Date of Report **12-15-17**  
Job No. **2147JL301**  
Event / Invoice No. **K301-001** Lab No. **82790**  
Authorized by **IORELLA J FUENTES** Date **11-14-17**  
Sampled by **CLIENT** Date **11-14-17**  
Submitted by **CLIENT** Date **11-14-17**  
Source / Location Designated by **CLIENT** Date **11-14-17**

Project **LABORATORY TESTING SERVICES**  
Location **VARIOUS**  
Type / Use of Material **SUBGRADE**  
Supplier / Source **PROJECT SITE**  
Sample Source / Location **4F-18-3**  
Special Instructions

**TEST RESULTS**

SIEVE ANALYSIS : FINER THAN NO. 200 :			LABORATORY COMPACTION CHARACTERISTICS :				METHOD					
SIEVE	ACCUMULATIVE % PASSING	SPECIFICATION					SAMPLE PREPARATION: <input type="checkbox"/> WET <input type="checkbox"/> DRY					
							RAMMER USED:		<input type="checkbox"/> 2 IN. CIRCULAR FACE <input type="checkbox"/> OTHER		<input type="checkbox"/> MECHANICAL <input type="checkbox"/> MANUAL	
							MAXIMUM DRY UNIT WEIGHT, LBF/FT <sup>3</sup> →		OPTIMUM WATER CONTENT, % →			
							OVERSIZE AGGREGATE :		BULK SPECIFIC GRAVITY :			
							ABSORPTION, % :		% OVERSIZE IN LAB SAMPLE :			
			WATER CONTENT, % DRY WEIGHT									
TEST PROCEDURE			RESULT	SPECS	TEST PROCEDURE		RESULT	SPECS				
<b>LIQUID &amp; PLASTIC PROPERTIES :</b>					<b>RESISTANCE TO DEGRADATION OF SMALL-SIZE COARSE AGGREGATES BY ABRASION :</b>							
ESTIMATED % RETAINED ON NO. 40					GRADING 100 REV. % LOSS →							
SAMPLE AIR DRIED <input type="checkbox"/> YES <input type="checkbox"/> NO					GRADING 500 REV. % LOSS →							
LIQUID LIMIT →					<b>SPECIFIC GRAVITY :</b>							
PLASTIC LIMIT →					MAX. PARTICLE SIZE, IN.		SPECIFIC GRAVITY @ 20°C →					
PLASTICITY INDEX →					pH DETERMINATION : AZ 237							
MOISTURE CONTENT :							pH →	<b>7.1</b>				
PORTION TESTED					<b>SOLUBLE SALTS :</b>							
EXPANSION / COMPRESSION PROPERTIES OF COHESIVE SOIL :					PPM →							
<input type="checkbox"/> EXPANSION <input type="checkbox"/> COMPRESSION, % →					<b>MINIMUM RESISTIVITY : AZ 236</b>							
SURCHARGE, PSF							OHM CM → <b>1868</b>					
INITIAL WATER CONTENT, %					<b>SOIL CLASSIFICATION :</b>							
DRY UNIT WEIGHT LBF/FT <sup>3</sup>					GROUP SYMBOL:							
EXPANSION INDEX OF SOIL :					NAME:							
INITIAL WATER CONTENT, %												
INITIAL DRY UNIT WEIGHT LBF/FT <sup>3</sup>												
INITIAL DEGREE OF SATURATION												
FINAL WATER CONTENT, %												

Comments :

Copies to : **CLIENT (1)**

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REVIEWED BY *MJ* 12-15-17



## Soil Analysis Report

Western Technologies  
Mike Whitman  
3737 E Broadway Road  
Phoenix , AZ 85040

Project: 2147JL301  
Date Received: 11/29/2017  
Date Reported: 11/30/2017  
PO Number: 2147P1943

**Lab Number: 923332-1                      82789**

<i>Sulfate &amp; Chloride</i>	Method	Result	Units	Levels
Sulfate, SO4	ARIZ 733	35	ppm	
Chloride, Cl	ARIZ 736	19	ppm	

**Lab Number: 923332-2                      82790**

<i>Sulfate &amp; Chloride</i>	Method	Result	Units	Levels
Sulfate, SO4	ARIZ 733	53	ppm	
Chloride, Cl	ARIZ 736	6	ppm	

APPENDIX C

DESIGN MAPS SUMMARY REPORT

# USGS Design Maps Summary Report

## User-Specified Input

**Report Title** GTEB  
Thu March 8, 2018 16:38:12 UTC

**Building Code Reference Document** 2012/2015 International Building Code  
(which utilizes USGS hazard data available in 2008)

**Site Coordinates** 31.57445°N, 110.35086°W

**Site Soil Classification** Site Class C – “Very Dense Soil and Soft Rock”

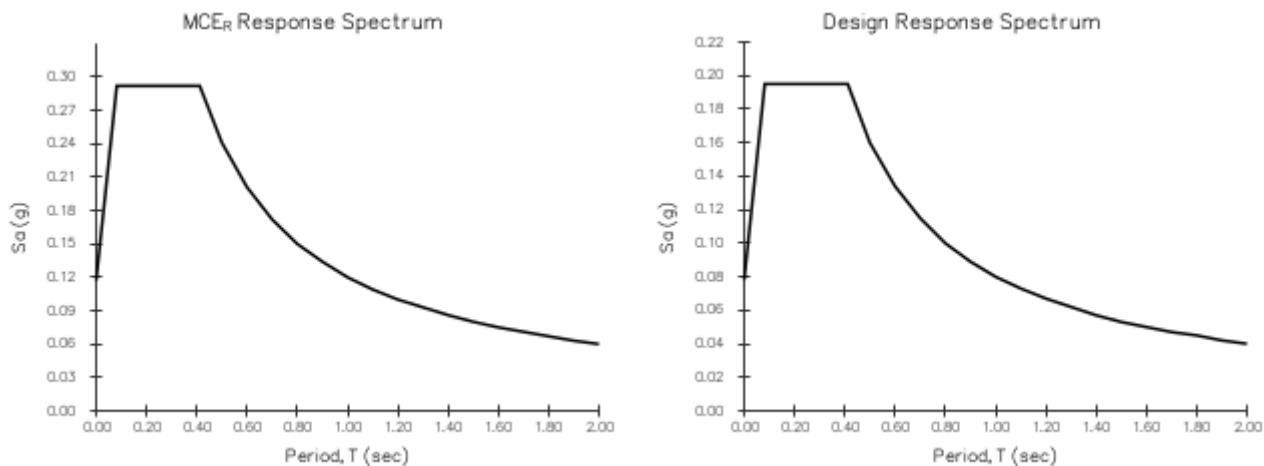
**Risk Category** I/II/III



## USGS-Provided Output

$S_s = 0.243 \text{ g}$        $S_{MS} = 0.292 \text{ g}$        $S_{DS} = 0.195 \text{ g}$   
 $S_1 = 0.071 \text{ g}$        $S_{M1} = 0.120 \text{ g}$        $S_{D1} = 0.080 \text{ g}$

For information on how the  $S_s$  and  $S_1$  values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the “2009 NEHRP” building code reference document.



Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.


**Design Maps Detailed Report**

2012/2015 International Building Code (31.57445°N, 110.35086°W)

Site Class C – “Very Dense Soil and Soft Rock”, Risk Category I/II/III

**Section 1613.3.1 — Mapped acceleration parameters**

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain  $S_s$ ) and 1.3 (to obtain  $S_1$ ). Maps in the 2012/2015 International Building Code are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 1613.3.3.

**From [Figure 1613.3.1\(1\)](#) <sup>[1]</sup>** $S_s = 0.243 \text{ g}$ **From [Figure 1613.3.1\(2\)](#) <sup>[2]</sup>** $S_1 = 0.071 \text{ g}$ **Section 1613.3.2 — Site class definitions**

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class C, based on the site soil properties in accordance with Section 1613.

2010 ASCE-7 Standard – Table 20.3-1  
SITE CLASS DEFINITIONS

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
Any profile with more than 10 ft of soil having the characteristics:			
<ul style="list-style-type: none"> <li>• Plasticity index <math>PI &gt; 20</math>,</li> <li>• Moisture content <math>w \geq 40\%</math>, and</li> <li>• Undrained shear strength <math>\bar{s}_u &lt; 500 \text{ psf}</math></li> </ul>			
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft<sup>2</sup> = 0.0479 kN/m<sup>2</sup>



### Section 1613.3.3 — Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters

TABLE 1613.3.3(1)  
VALUES OF SITE COEFFICIENT  $F_a$

Site Class	Mapped Spectral Response Acceleration at Short Period				
	$S_s \leq 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of  $S_s$

**For Site Class = C and  $S_s = 0.243$  g,  $F_a = 1.200$**

TABLE 1613.3.3(2)  
VALUES OF SITE COEFFICIENT  $F_v$

Site Class	Mapped Spectral Response Acceleration at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of  $S_1$

**For Site Class = C and  $S_1 = 0.071$  g,  $F_v = 1.700$**

**Equation (16-37):**

$$S_{MS} = F_a S_S = 1.200 \times 0.243 = 0.292 \text{ g}$$

---

**Equation (16-38):**

$$S_{M1} = F_v S_1 = 1.700 \times 0.071 = 0.120 \text{ g}$$

---

## Section 1613.3.4 — Design spectral response acceleration parameters

**Equation (16-39):**

$$S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 0.292 = 0.195 \text{ g}$$

---

**Equation (16-40):**

$$S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.120 = 0.080 \text{ g}$$

---

## Section 1613.3.5 — Determination of seismic design category

TABLE 1613.3.5(1)

SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD (0.2 second) RESPONSE ACCELERATION

VALUE OF $S_{DS}$	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33g \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D

For Risk Category = I and  $S_{DS} = 0.195 g$ , Seismic Design Category = B

TABLE 1613.3.5(2)

SEISMIC DESIGN CATEGORY BASED ON 1-SECOND PERIOD RESPONSE ACCELERATION

VALUE OF $S_{D1}$	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and  $S_{D1} = 0.080 g$ , Seismic Design Category = B

Note: When  $S_1$  is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category  $\equiv$  "the more severe design category in accordance with Table 1613.3.5(1) or 1613.3.5(2)" = B

Note: See Section 1613.3.5.1 for alternative approaches to calculating Seismic Design Category.

## References

1. Figure 1613.3.1(1): [https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(1\).pdf](https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(1).pdf)
2. Figure 1613.3.1(2): [https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(2\).pdf](https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(2).pdf)

APPENDIX D

PCASE PAVEMENT DESIGN

PROGRAM RESULTS

Pavement Design Report  
 U.S. Army Corps of Engineers  
**PCASE Version 2.09.02**  
 Date : 2/13/2018

Design Name : Operation Vehicles and Equipment  
 Parking  
 Design Type : Roads  
 Pavement Type : Flexible  
 Road Type : Parking Area  
 Terrain Type : Flat  
 Analysis Type : CBR  
 Depth of Frost (in) : 0  
 Wander Width (in) : 33.35

**Use 2"RMP over 2"AC over 6" AB over 6"SB**

NOTE: The M1070 Tractor with M1000 Trailer carrying an M1A1 tank gov  
 the design.

NOTE: car & pickup traffic are irrelevant to the result, therefore were not I

NOTE: A conservative CBR of 6 is based on lab results performed on De  
 and historical experience at Fort Huachuca.

**Layer Information**

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Asphalt	Asphalt	NFS	Compute	4	0	0	0
Base	Unbound Crushed Stone	NFS	Manual	6	0	0	80
Subbase	Unbound Aggregate	NFS	Manual	6	0	0	20
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	6

**Traffic Information**

Pattern Name : PARKING LOT  
 COMPLEX

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
M1070 HET TRACTOR W/M1000 TRL W/M1A1 TANK	229750	403000	403000
M1074 LOAD SYSTEM W/CRANE	86317	403000	13880
M1A1, MAIN TANK TRACKED	126000	403000	266
M2A3, BRADLEY VEHICLE TRACKED	58200	403000	1
P-23 CRASH TRUCK (FIRE TRUCK)	77880	300	184
STRYKER, RECON VEHICLE	43352	403000	1
Equivalent Single Axle Loads			1.121E+12

Pavement Design Report  
 U.S. Army Corps of Engineers  
**PCASE Version 2.09.02**  
 Date : 2/13/2018

Design Name : FACILITY PARKING LOT  
 Design Type : Roads  
 Pavement Type : Flexible  
 Road Type : Parking Area  
 Terrain Type : Flat  
 Analysis Type : CBR  
 Depth of Frost (in) : 0  
 Wander Width (in) : 33.35

**Use 2" Asphalt Concrete over 6" Aggregate Base Course over  
 6" Subbase Aggregate Course**

NOTE: A conservative CBR of 6 is based on lab results performed on Dec 2017 and historical experience at Fort Huachuca.

**Layer Information**

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Asphalt	Asphalt	NFS	Compute	2	0	0	0
Base	Unbound Crushed Stone	NFS	Manual	6	0	0	80
Subbase	Unbound Aggregate	NFS	Manual	6	0	0	20
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	6

**Traffic Information**

Pattern Name : FACILITY PARKING LOT

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
CAR - PASSENGER	3000	1029600	1
TRUCK, LARGE PICKUP OR SUV	7500	2402400	2402400

Equivalent Single Axle Loads 356

Pavement Design Report  
 U.S. Army Corps of Engineers  
**PCASE Version 2.09.02**  
 Date : 8/29/2018

Design Name : TANK TRAIL  
 Design Type : Roads  
 Pavement Type : Unsurfaced  
 Road Type : Road  
 Terrain Type : Flat  
 Analysis Type : CBR  
 Depth of Frost (in) : 0  
 Wander Width (in) : 33.35

**Use 6" Aggregate Base over 6" Subbase Course over 6" CSG**

NOTE: A conservative CBR of 6 is based on lab results performed on Dec 2017 and historical experience at Fort Huachuca.

**Layer Information**

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Unsurfaced	Unbound Aggregate	NFS	Compute	4.78	0	0	80
Subbase	Unbound Aggregate	NFS	Manual	6	0	0	20
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	6

**Traffic Information**

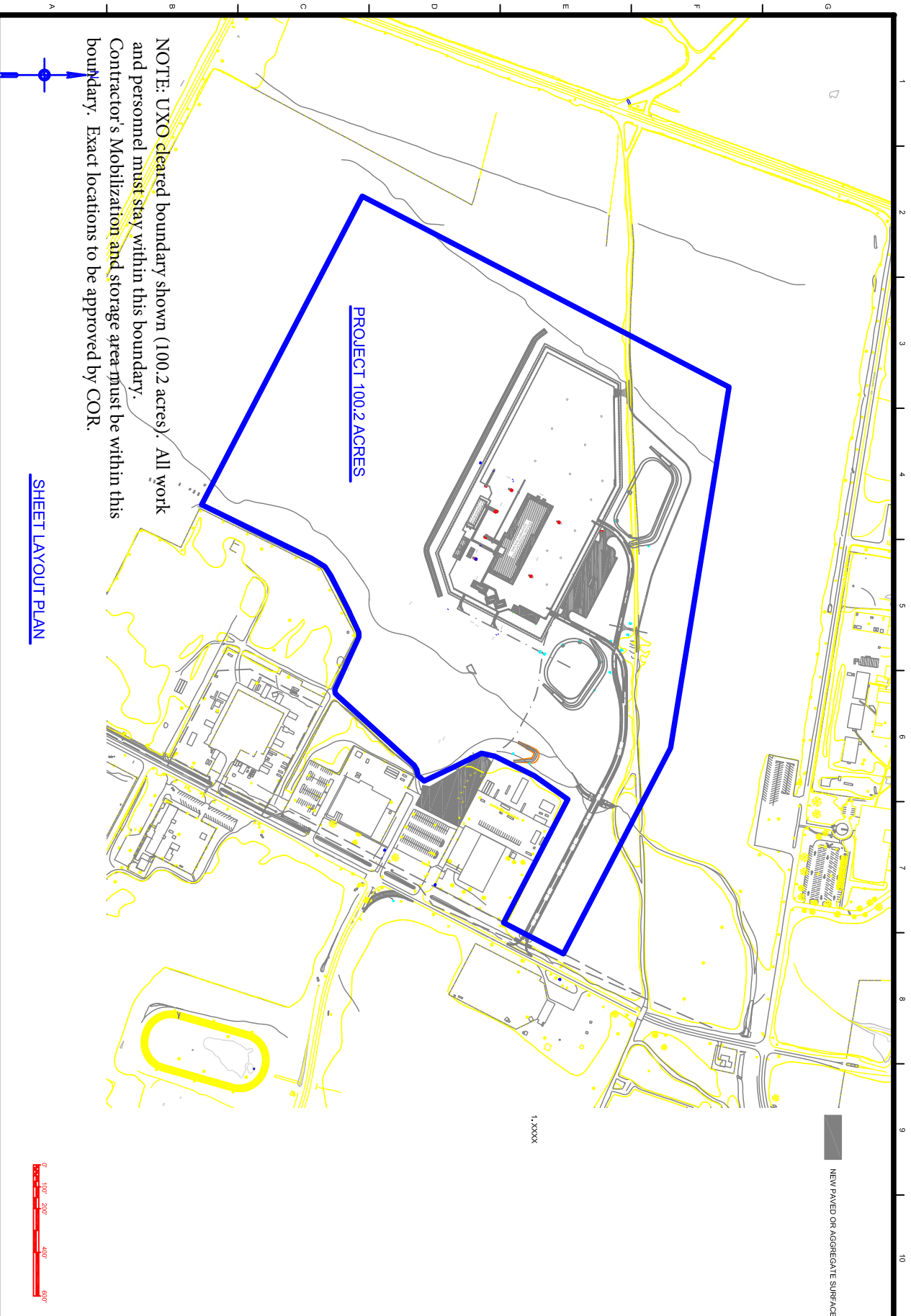
Pattern Name : PARKING LOT COMPLEX

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
M1070 HET TRACTOR			
W/M1000 TRL W/M1A1 TANK	229750	403000	403000
M1074 LOAD SYSTEM W/CRANE	86317	403000	13880
M1A1, MAIN TANK TRACKED	126000	403000	266
M2A3, BRADLEY VEHICLE TRACKED	58200	403000	1
P-23 CRASH TRUCK (FIRE TRUCK)	77880	300	184
STRYKER, RECON VEHICLE	43352	403000	1
Equivalent Single Axle Loads			1.1E+12

NOTE: UXO cleared boundary shown (100.2 acres). All work and personnel must stay within this boundary. Contractor's Mobilization and storage area must be within this boundary. Exact locations to be approved by COR.

PROJECT 100.2 ACRES

SHEET LAYOUT PLAN



1:XXX

NEW PAVED OR AGGREGATE SURFACE



<b>CS102</b> SHEET 10 RTA	FT HUACHUCA GROUND TRANSPORT EQUIPMENT BUILDING <b>SHEET LAYOUT PLAN</b> SITE, GRADING, UTILITIES	U.S. ARMY CORPS OF ENGINEERS		DESIGNED BY: [redacted]	ISSUE DATE: [redacted]	<table border="1"> <thead> <tr> <th>MARK</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	MARK	DESCRIPTION	DATE																											
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U.S. ARMY CORPS OF ENGINEERS 	DRAWN BY: [redacted] CHECKED BY: [redacted] SUBMITTED BY: [redacted] SIZE: [redacted]	SOLICITATION NO.: [redacted] CONTRACT NO.: [redacted] DESIGN FILE NO.: [redacted] FILE NAME: [redacted]																																		



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## SECTION 09 84 20

## ACOUSTICAL WALL PANELS

## PART 1 GENERAL

## 1.1 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 TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC 16 (2004; E 2008; E 2010) Colorfastness to Light

## AMERICAN FOREST FOUNDATION (AFF)

ATFS STANDARDS (2015) American Tree Farm System Standards of Sustainability 2015-2020

## ASTM INTERNATIONAL (ASTM)

ASTM C423 (2009a) Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

ASTM D5034 (2009; R 2017) Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)

ASTM E84 (2018a) Standard Test Method for Surface Burning Characteristics of Building Materials

## CSA GROUP (CSA)

CSA Z809-08 (R2013) Sustainable Forest Management

## FOREST STEWARDSHIP COUNCIL (FSC)

FSC STD 01 001 (2015) Principles and Criteria for Forest Stewardship

## INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC (2018) International Building Code

## PROGRAMME FOR ENDORSEMENT OF FOREST CERTIFICATION (PEFC)

PEFC ST 2002:2013 (2015) PEFC International Standard Chain of Custody of Forest Based Products Requirements

## SUSTAINABLE FOREST INITIATIVE (SFI)

SFI 2015-2019

(2015) Standards, Rules for Label Use,  
Procedures and Guidance

## 1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

## SD-02 Shop Drawings

Approved Detail Drawings; G

## SD-03 Product Data

Installation

Acoustical Wall Panels; G

## SD-04 Samples

Acoustical Wall Panels; G

## SD-07 Certificates

Acoustical Wall Panels

Certified Sustainably Harvested Wood; S

## SD-11 Closeout Submittals

Warranty

## 1.3 CERTIFICATIONS

## 1.3.1 Certified Sustainably Harvested Wood

Provide wood certified as sustainably harvested by FSC STD 01 001, ATFS STANDARDS, CSA Z809-08, SFI 2015-2019s, or other third party program certified by PEFC ST 2002:2013. Provide a letter of Certification of Sustainably Harvested Wood signed by the wood supplier. Identify certifying organization and their third party program name and indicate compliance with chain-of-custody program requirements. Submit sustainable wood certification data; identify each certified product on a line item basis. Submit copies of invoices bearing certification numbers.

## 1.4 DELIVERY, STORAGE, AND HANDLING

Protect materials delivered and placed in storage from the weather, humidity and temperature variations, dirt, dust, or other contaminants.

## 1.5 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that

extend beyond a one year period.

## PART 2 PRODUCTS

### 2.1 SYSTEM DESCRIPTION

#### 2.1.1 Design

Provide fabric wrapped mineral / glass-fiber core acoustical wall panel materials in the manufacturer's standard sizes and finishes of the type, design and configuration indicated.

### 2.2 FABRIC COVERED ACOUSTICAL WALL PANELS

Provide acoustical wall panels consisting of prefinished, factory assembled, seamless fabric covered, fiber glass or mineral fiber core system as described below manufactured to the dimensions and configurations shown on the approved detail drawings; submit drawings showing plan locations, elevations and details of method of anchorage, location of doors and other openings, base detail and shape and thickness of materials. Perimeter edges must be reinforced by either an aluminum frame or a formulated resin edge hardener. Acoustical wall panels installed in non-sprinklered areas must comply with the requirements of ICC IBC, Standard 42-2. Submit manufacturer's descriptive data and catalog cuts; fabric and vinyl swatches, minimum 18 inches wide by 24 inches long 3 samples of each color range specified; and certificates of compliance from an independent laboratory accredited by the National Laboratory Accreditation Program of the National Institute of Standards. A label or listing from the testing laboratory will be acceptable evidence of compliance. Wall panels must conform to the following:

#### 2.2.1 Panel Width

Panel width must be as detailed.

#### 2.2.2 Panel Height

Panel height must be as detailed.

#### 2.2.3 Thickness

Panel thickness shall be 1".

#### 2.2.4 Fabric Covering

Seamless non-woven, embossed texture, needle punched 100 percent polyester, minimum 11 ounces/linear yard. Tear strength a minimum 25 pounds machine direction and minimum 40 pounds cross-machine direction. Tensile strength a minimum 50 pounds machine direction and minimum 75 pounds cross-machine direction in accordance with ASTM D5034. Stretch fabric covering free of wrinkles and then bond to the edges and back or bond directly to the panel face, edges, and back of panel a minimum distance standard with the manufacturer. Light fastness (fadeometer) approximately 40 hours in accordance with AATCC 16.

#### 2.2.5 Fire Rating for the Complete Composite System

Class A, 200 or less smoke density and flame spread less than 25, when tested in accordance with ASTM E84.

2.2.6 Substrate

Fiber glass or mineral fiber

2.2.7 Noise Reduction Coefficient (NRC) Range

0.80-0.90 ASTM C423

2.2.8 Edge Detail

Square edge with fabric wrapped on all four sides.

2.2.9 Core Type

Standard acoustical core

2.2.10 Mounting Acoustical Panels

Mount acoustical panels by manufacturer's standard concealed spline.

2.3 COLOR

As indicated in finish schedule.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

must shall be clean, smooth, oil free and prepared in accordance with panel manufacturer's instructions. Do not begin installation until all wet work, such as, plastering, painting, and concrete are completely dry.

3.2 INSTALLATION

Panel installation must be by personnel familiar with and normally engaged in installation of acoustical wall panels. Apply panels in accordance with the manufacturer's installation instructions. Submit manufacturer's installation instructions and recommended cleaning instructions.

3.3 CLEANING

Following installation, clean dirty or stained panel surfaces in accordance with manufacturer's instructions and leave free from defects. Remove and replace panels that are damaged, discolored, or improperly installed.

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33 82 00 TELECOMMUNICATIONS OUTSIDE PLANT (OSP)

**DIVISION 41 - MATERIAL PROCESSING AND HANDLING EQUIPMENT**

41 22 13.13 BRIDGE CRANES

-- End of Project Table of Contents --

## Schedule Status Report; G

## 1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of 2-years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

## PART 2 PRODUCTS

## 2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.

## 2.1.1 Government Default Software

The Government intends to use Primavera P6, Release 7.0. Save all files in the Primavera PM XER format.

## 2.1.2 Contractor Software

Use commercially available scheduling software with vendor software support agreements available. The software routine used to create the required SDEF file must be created and supported by the software manufacturer.

## 2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the XER export file in a version of P6 importable by the Government system.

## 2.1.2.2 Other Than Primavera

If the contractor chooses software other than Primavera P6, that is compliant with this specification, provide for the Government's use two licenses, two computers, and training for two Government employees in the use of the software. These computers will be stand-alone and not connected to Government network. Computers and licenses will be returned at project completion.

## PART 3 EXECUTION

## 3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15, SCHEDULE FOR CONSTRUCTION CONTRACTS. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Subcontractors and suppliers

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		01 32 01	SD-01 Preconstruction Submittals														
			Project Scheduler Qualifications	1.3	G												
			Bar Chart Schedule	3.5													
			Project Schedule	3.1	G												
			Preliminary Project Schedule	3.5.1	G												
			Initial Project Schedule	3.5.2	G												
			Data Optical Discs	3.6.1													
			Periodic Schedule Update	3.5.3	G												
			Periodic Schedule Update	3.7.2	G												
			Justification of Delay	3.9.1	G												
			Time Impact Analysis	3.9.3	G												
			Forensic Schedule Analysis	3.9.4	G												
			Schedule Status Report	3.1.1	G												
		01 33 00	SD-01 Preconstruction Submittals														
			Submittal Register	1.9	G												
			SD-02 Shop Drawings														
			Mechanical Room Layout Drawings	1.13													
		01 33 29	SD-01 Preconstruction Submittals														
			Preliminary High Performance and Sustainable Building Checklist	1.5.3.1	G DO												
			Sustainability Action Plan	1.4.1	G DO												
			Preliminary Sustainability eNotebook	1.5.3.1	G DO												
			SD-11 Closeout Submittals														

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		01 33 29	Final High Performance and Sustainable Building Checklist	1.5.3.1	G DO													
			Final Sustainability eNotebook	1.5.3.1	G DO													
			Amended Final Sustainability eNotebook	1.5.3.1	G DO													
			Amended Final High Performance and Sustainable Building Checklist	1.5.3.1	G DO													
			Third Party Certification Certificates or Validation	3.2	G DO													
		01 35 26	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.6	G DO													
			Health Hazard Control Plan	1.6.2.14	G													
			Emergency Action Plan	1.6.2.15	G													
			Standard Lift Plan	1.6.2.2	G													
			Critical Lift Plan	1.6.2.3	G DO													
			Activity Hazard Analysis (AHA)	1.7														
			SD-06 Test Reports															
			Monthly Exposure Reports	1.11.3														
			Notifications and Reports	1.11														
			Accident Investigation Reports	1.11.2	G DO													
			LHE Inspection Reports	1.11.4														
			Regulatory Citations and Violations	1.11.6														
			SD-07 Certificates															
			Crane Operators/Riggers	1.5.1.4														

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		01 35 26	Confined Space Entry Permit	1.8.1													
			Hot Work Permit	1.8.1													
			Certificate of Compliance	1.11.5													
			Excavation Permit	3.7													
			Proof of Current Qualification	1.5.1.4													
		01 45 00	SD-01 Preconstruction Submittals														
			Contractor Quality Control Plan	3.2	G												
			MTC validation	3.7.2.1	G												
			SD-06 Test Reports														
			Verification Statement	3.9.2													
		01 45 35	SD-01 Preconstruction Submittals														
			Written Practices	3.1.2													
			NDT Procedures and Equipment Calibration Records	3.1.2													
			SD-06 Test Reports														
			Daily Reports	3.1.2													
			Biweekly Reports	3.1.1													
			SD-07 Certificates														
			Fabrication Plant	2.1													
			Steel Truss Plant	2.1													
			Wood Truss Plant	2.1													
			AC472 Accreditation	2.1													
			Steel Joist Institute Membership	2.1													
			Certified Plant	2.1													
			Certificate of Compliance	2.1													
			Special Inspector	1.5	G												

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		01 45 35	Qualification Records	3.1.2														
			SD-11 Closeout Submittals															
			Comprehensive Final Report	3.1.2	G													
		01 50 00	SD-01 Preconstruction Submittals															
			Construction Site Plan	1.3	G													
			Traffic Control Plan	3.1.10.1	G													
			Temporary Earthwork Plan	1.4	G													
			Dust Control Methods And Procedures	3.1.10.3	G													
			SD-06 Test Reports															
			Backflow Preventer Tests	2.4														
			SD-07 Certificates															
			Backflow Tester	1.7.1														
			Backflow Preventers	1.7														
			Backflow Prevention Training Certificate	1.7.2														
		01 57 20	SD-01 Preconstruction Submittals															
			Environmental Protection Plan	1.7	G DO													
		01 57 23	SD-01 Preconstruction Submittals															
			SWPPP	1.5.1	G DO													
			SWPPP	1.5.1	G DO													
			PRRs	1.5.2	G DO													
			PRRs	1.5.2	G DO													
			PRRs	1.5.2	G DO													
			SD-03 Product Data															
			BMP Product Data	1.5.1.3														

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																		(g)
		01 57 23	BMP Product Data	3.1.1														
			BMP Product Data	3.1.1														
			BMP Product Data	3.1.1														
			Geotextiles And Mats	2.1.1.4	G DO													
			SD-06 Test Reports															
			SWPPP Amendment	3.1.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			Sampling Results	1.5.2														
			Sampling Results	3.2.4														
			Inspection Reports	3.2.2														
			Annual Report	1.5.2														
			Annual Report	3.1.2														
			Annual Report	3.1.2														
			SD-10 Operation and Maintenance Data															
			Post-Construction Stormwater Management Plan	3.1.2	G DO													
			Post-Construction Stormwater Management Plan	3.1.2	G DO													
			SD-11 Closeout Submittals															
			Final SWPPP	3.1.2	G DO													
			Final SWPPP	3.2.1	G DO													



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		01 57 23	NOT Application	3.1.2	G DO													
			NOT Application	3.1.2	G DO													
			NOT Application	3.1.2	G DO													
		01 74 19	SD-01 Preconstruction Submittals															
			Waste Management Plan	1.6	G													
			SD-11 Closeout Submittals															
			Records	1.7														
		01 78 00	SD-03 Product Data															
			Warranty Management Plan	1.7.1														
			Warranty Tags	1.7.5														
			Spare Parts Data	1.5														
			SD-06 Test Reports															
			working as-built drawings	3.1.4	G													
			final as-built record drawings	3.2	G DO													
			SD-08 Manufacturer's Instructions															
			Instructions	1.7.1														
			SD-10 Operation and Maintenance Data															
			Operation and Maintenance Manuals	3.9														
			SD-11 Closeout Submittals															
			Record Drawings	1.3.4	G DO													
			Certification of EPA Designated Items	2.3	G													
			Interim DD FORM 1354	3.11	G													
			Checklist for DD FORM 1354	3.11	G													

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 78 00	Final Approved Shop Drawings	3.6	G												
			Construction Contract	3.7	G												
			Specifications														
			As-Built Record Of Equipment	3.8													
			And Materials														
		01 78 23	SD-10 Operation and Maintenance														
			Data														
			O&M Database	1.3	G												
			Training Plan	3.1.1	G												
			Training Outline	3.1.3	G												
			Training Content	3.1.2	G												
			SD-11 Closeout Submittals														
			Training Video Recording	3.1.4	G												
			Validation of Training Completion	3.1.6	G												
		01 91 00.15	SD-06 Test Reports														
			Design Review Report	3.1.4	G DO												
			Interim Construction Phase	3.1.3.1	G DO												
			Commissioning Plan														
			Final Construction Phase	3.1.3.2	G DO												
			Commissioning Plan														
			Template Building Envelope	3.1.3.1.2	G DO												
			Inspection Checklists														
			Building Envelope Inspection	3.1.6.2	G DO												
			Checklists														
			Pre-Functional Checklists	3.1.6.3	G DO												
			Issues Log	1.9													

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		01 91 00.15	Commissioning Report	3.2	G DO												
			Post-Construction Trend Log Report	3.3.1	G DO												
			SD-07 Certificates														
			Certificate of Readiness	1.10	G DO												
			SD-10 Operation and Maintenance Data														
			Training Plan	3.1.7	G RO												
			Training Attendance Rosters	3.1.7	G RO												
			Systems Manual and Computerized Maintenance Management System Manual	3.1.8	G DO												
			Maintenance and Service Life Plans	3.1.9	G DO												
			SD-11 Closeout Submittals														
			Construction Phase Commissioning Plan	3.1.3.1	S DO												
			Final Commissioning Report	3.2	S DO												
		02 41 00	SD-01 Preconstruction Submittals														
			Demolition Plan	1.2.1	G												
			Existing Conditions	1.9													
			SD-07 Certificates														
			Notification	1.6	G												
			SD-11 Closeout Submittals														
			Receipts	3.3.4													
		02 82 13	SD-02 Shop Drawings														

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		02 82 13	Detailed Drawings	1.3	G												
			SD-03 Product Data														
			Asbestos Waste Shipment Records	3.10.3.1	G												
			Encapsulants	2.1	G												
			Respiratory Protection Program	1.8.1	G DO												
			Cleanup and Disposal	3.10	G												
			Qualifications	1.5.1	G												
			Training Program	1.10													
			Licenses, Permits and Notifications	1.7.1													
			Asbestos Management Plan	3.10.3.2	G DO												
			SD-06 Test Reports														
			Exposure Assessment and Air Monitoring	3.8													
			Local Exhaust System	1.6.3													
			SD-07 Certificates														
			Local Exhaust System	1.6.3													
			Encapsulants	2.1	G												
			Medical Surveillance	1.8													
			Requirements														
		02 83 13	SD-01 Preconstruction Submittals														
			Lead Compliance Plan	1.5.2.2	G												
			Competent Person	1.5.1.1	G												
			Training Certification	1.5.1.2	G												
			Lead waste management plan	1.5.2.8	G												

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		02 83 13	Written evidence	3.5.2.1	G												
			Medical Examinations	1.5.2.4	G												
			SD-06 Test Reports														
			Sampling results	1.5.2.3	G												
			Occupational and Environmental Assessment Data Report	1.5.2.3	G												
			SD-07 Certificates														
			Testing laboratory	1.5.1.3													
			Clearance Certification	3.5.1.1													
			SD-11 Closeout Submittals														
			hazardous waste manifest	3.5.2.1													
			turn-in documents or weight tickets	3.5.2.1													
		02 84 16	SD-06 Test Reports														
			Testing Results	3.3.1	G												
			SD-07 Certificates														
			Qualifications of CIH	1.8.1													
			Training Certification	1.8.1													
			PCB and Lamp Removal Work Plan	1.8.2	G												
			PCB and Lamp Disposal Plan	1.8.3	G												
			Certification of Decontamination	3.2.4	G												
			SD-11 Closeout Submittals														
			Transporter certification	3.5.2	G												
			Certificate of Disposal and/or recycling	3.5.2.1													

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																		(g)
		02 84 16	DD Form 1348-1	3.5.3														
		03 11 13	SD-02 Shop Drawings															
			Formwork	2.2.1	G													
			Formwork	3.1.1	G													
			Form Removal Schedule	2.2.1	G													
			SD-03 Product Data															
			Form Materials	2.2														
			SD-04 Samples															
			Sample Panels	1.3	G													
			SD-05 Design Data															
			Calculations	2.1														
			SD-06 Test Reports															
			Inspection	3.2														
		03 15 00	SD-03 Product Data															
			Preformed Expansion Joint Filler	2.2														
			Sealant	2.3														
			SD-04 Samples															
			Lubricant for Preformed	2.3.2														
			Compression Seals															
			Field-Molded Type	2.3.3														
			SD-07 Certificates															
			Preformed Expansion Joint Filler	2.2														
			Sealant	2.3														
		03 20 00	SD-02 Shop Drawings															
			Reinforcement	3.1	G													
			SD-03 Product Data															

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																		(g)
		03 20 00	Mechanical Butt-Splices	2.3.1														
			SD-07 Certificates															
			Reinforcing Steel	2.3														
			Qualified Welders	1.3.1														
			Qualification of Steel Bar	1.3.2														
			Butt-Splicers															
		03 30 00	SD-01 Preconstruction Submittals															
			Quality Control Plan	1.4.2	G													
			Laboratory Accreditation	1.4.1														
			Sampling Plan	3.9.5.4	G													
			SD-03 Product Data															
			Recycled Content Products	Part 2														
			Cementitious Materials	2.2														
			Vapor Barrier	2.11														
			Floor Finish	2.1.5														
			Floor Hardener	2.9														
			Chemical Admixtures	2.4														
			SD-04 Samples															
			Surface Retarder	2.4.5														
			SD-05 Design Data															
			Mixture Proportions	2.1.1	G													
			SD-06 Test Reports															
			Mixture Proportions	2.1.1	G													
			Testing and Inspection for CQC	3.9	G													
			Fly Ash	2.2.2														

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		03 30 00	Ground Granulated Blast-Furnace (GGBF) Slag	2.2.3													
			Aggregates	2.3													
			Air Content	3.9.5.1													
			Slump	3.9.5.2													
			Compressive Strength	3.9.5.4													
			Water	2.5													
			SD-07 Certificates														
			Contractor Quality Control personnel	1.4													
			Ready-Mix Plant	3.2.1													
		03 35 00	SD-03 Product Data														
			Recycled Content Products	Part 2													
			SD-04 Samples														
			Field Test Panels	1.3.1													
			Sample Wall Panels	1.3.1.1													
			Slab Panels	1.3.1.2													
		03 39 00	SD-03 Product Data														
			Curing Materials	2.1													
			SD-06 Test Reports														
			Testing and Inspection for CQC	3.2													
			SD-08 Manufacturer's Instructions														
			Curing Compound	2.1													
		03 42 13	SD-01 Preconstruction Submittals														
			Quality Control Procedures	1.3.2.2													
			SD-02 Shop Drawings														



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		03 42 13	Standard Precast Units	2.1.1	G													
			Custom-Made Precast Units	2.1.2	G													
			Special Finishes	3.2.4.3														
			SD-03 Product Data															
			Standard Precast Units	2.1.1														
			Proprietary Precast Units	2.1.3														
			Embedded Items	3.1.3														
			Accessories	2.2.4														
			SD-05 Design Data															
			Design Calculations	2.1.2	G													
			Concrete Mix Proportions	2.1.5.1														
			SD-06 Test Reports															
			Test Reports	1.3.2.4														
			SD-07 Certificates															
			Quality Control Procedures	1.3.2.2														
		04 20 00	SD-02 Shop Drawings															
			Cut CMU	3.3.2.1	G													
			Detail Drawings	3.4.1.1	G													
			SD-03 Product Data															
			Hot Weather Procedures	1.5.1	G													
			Cold Weather Procedures	1.5.2	G													
			Cement	2.2.2.2.1	G													
			Cementitious Materials	2.4.1.1	G													
			SD-04 Samples															
			Mock-Up Panel	1.3.1.1	G													
			Admixtures for Masonry Mortar	2.4.1.4	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		04 20 00	Anchors, Ties, and Bar Positioners	2.6.2	G													
			Joint Reinforcement	1.3.1.3	G													
			SD-05 Design Data															
			Masonry Compressive Strength	2.1.2	G													
			Fire-Rated Concrete Masonry Units	2.2.2.5														
			Bracing Calculations	3.2.5	G													
			SD-06 Test Reports															
			Field Testing of Mortar	3.6.1.1														
			Field Testing of Grout	3.6.1.2														
			Prism Tests	3.6.1.3														
			SD-07 Certificates															
			Special Masonry Inspector Qualifications	1.3.2														
			Cementitious Materials	2.4.1.1														
			Admixtures for Masonry Mortar	2.4.1.4														
			Admixtures for Grout	2.4.2.2														
			Anchors, Ties, and Bar Positioners	2.6.2														
			Joint Reinforcement	1.3.1.3														
			SD-08 Manufacturer's Instructions															
			Admixtures for Masonry Mortar	2.4.1.4														
			Admixtures for Grout	2.4.2.2														
			SD-10 Operation and Maintenance Data															

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		04 20 00	Take-Back Program	3.8														
		05 05 23.16	SD-01 Preconstruction Submittals															
			Welding Quality Assurance Plan	3.2	G													
			SD-03 Product Data															
			Welding Procedure Qualifications	1.3	G													
			Welder, Welding Operator, and Tacker Qualification	1.3.5														
			Inspector Qualification	1.3.6														
			Previous Qualifications	1.3.2														
			Pre-Qualified Procedures	1.3.3														
			Welding Electrodes and Rods	2.2														
			SD-06 Test Reports															
			Nondestructive Testing	3.3														
			SD-07 Certificates															
			Certified Welding Procedure Specifications (WPS)	1.3.1														
			Certified Brazing Procedure Specifications (BPS)	1.3.1														
			Certified Procedure Qualification Records (PQR)	1.3.1														
			Certified Welder Performance Qualifications (WPQ)	1.3.1														
			Certified Brazer Performance Qualifications (BPQ)	1.3.1														
		05 12 00	SD-01 Preconstruction Submittals															
			Erection Drawings	1.5.1.1	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		05 12 00	SD-02 Shop Drawings															
			Fabrication drawings	1.5.2	G													
			SD-03 Product Data															
			Shop primer	2.6.2														
			Welding electrodes and rods	2.4.1														
			Direct Tension Indicator Washers	2.3.2.3														
			Non-Shrink Grout	2.4.2														
			Tension control bolts	2.3.3														
			SD-06 Test Reports															
			Class B coating	2.6.2														
			Bolts	2.3.1.1														
			Bolts	2.3.2.1														
			Nuts	2.3.1.2														
			Nuts	2.3.2.2														
			Washers	2.3.1.3														
			Washers	2.3.2.4														
			Weld Inspection Reports	3.8.1.2														
			Direct Tension Indicator Washer Inspection Reports	3.8.2.1														
			Bolt Testing Reports	3.8.3.1														
			Embrittlement Test Reports	3.8.4														
			SD-07 Certificates															
			Steel	2.2														
			Bolts	2.3.1.1														
			Bolts	2.3.2.1														
			Nuts	2.3.1.2														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION	
																		(g)
		05 12 00	Nuts	2.3.2.2														
			Washers	2.3.1.3														
			Washers	2.3.2.4														
			Galvanizing	2.5														
			AISC Fabrication Plant Quality Certification	1.3														
			AISC Erector Quality Certification	1.3														
			Welding procedures and qualifications	1.5.3.1														
			Welding electrodes and rods	2.4.1														
		05 21 00	SD-01 Preconstruction Submittals															
			Welder Qualification	1.3.2														
			SD-02 Shop Drawings															
			Steel Joist Framing	1.3.1	G													
			SD-05 Design Data															
			Design Calculations	2.2	G													
			SD-06 Test Reports															
			Erection Inspection	3.4														
			Welding Inspections	3.4														
			SD-07 Certificates															
			Certification of Compliance	1.3.2														
			SD-11 Closeout Submittals															
			Recycled Content of Steel Products	2.3	S													
		05 30 00	SD-02 Shop Drawings															
			Fabrication Drawings	1.3.4	G RO													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(g)
		05 30 00	Roof Deck Units	2.3	G RO													
			Cant Strips	2.3.2.1	G RO													
			Ridge and Valley Plates	2.3.2.2	G RO													
			Metal Closure Strips	2.3.2.3	G RO													
			SD-03 Product Data															
			Accessories	2.2														
			Deck Units	2.3.1	G RO													
			Galvanizing Repair Paint	2.1.5														
			Joint Sealant Material	2.1.4														
			Roof Deck Units	2.3														
			Repair Paint	2.3.4														
			Welder Qualifications	1.3.2														
			Welding Equipment	1.3.2														
			Welding Rods and Accessories	1.3.2														
			SD-04 Samples															
			Roof Deck Units	2.3														
			Flexible Closure Strips	2.1.6														
			Flexible Closure Strips	2.3														
			Accessories	2.2														
			SD-05 Design Data															
			Deck Units	2.3.1	G RO													
			SD-07 Certificates															
			Welding Procedures	1.3.2														
			Fire Safety	1.3.3.1														
			Wind Storm Resistance	1.3.3.2														
		05 40 00	SD-02 Shop Drawings															

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		05 40 00	Framing Components	1.6.1	G													
			SD-03 Product Data															
			Studs, Joists	2.1														
			SD-05 Design Data															
			Metal Framing Calculations	1.6.2	G													
			SD-07 Certificates															
			Load-Bearing Cold-Formed Metal Framing	1.4														
			Welds	3.2.1														
			SD-11 Closeout Submittals															
			Recycled Content of Steel Products	2.1	S													
		05 50 13	SD-02 Shop Drawings															
			Floor Gratings	2.4	G													
			Roof Walkways	2.4	G													
			Bollards/Pipe Guards	2.5	G													
			SD-03 Product Data															
			Floor Gratings	2.4	G													
			Roof Walkways	2.4	G													
			SD-07 Certificates															
			Certificates of Compliance	2.1	G													
			Certified Mill	2.2	G													
			SD-11 Closeout Submittals															
			Recycled Content	2.1	S													
		05 51 00	SD-02 Shop Drawings															
			Iron and Steel Hardware	2.1	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		05 51 00	Steel Shapes, Plates, Bars, and Strips	2.1	G												
			Metal Stair System	2.2.1	G												
			SD-03 Product Data														
			Structural-Steel Plates, Shapes, and Bars	2.4.1	G												
			Structural-Steel Tubing	2.4.2	G												
			Hot-Rolled Carbon Steel Sheets and Strips	2.4.5	G												
			Cold-Finished Steel Bars	2.4.4	G												
			Hot-Rolled Carbon Steel Bars	2.4.3	G												
			Cold-Rolled Carbon Steel Sheets	2.4.6	G												
			Galvanized Carbon Steel Sheets	2.4.7	G												
			Cold-Drawn Steel Tubing	2.4.8	G												
			Gray Iron Castings	2.4.9	G												
			Malleable Iron Castings	2.4.10	G												
			Concrete Inserts	2.3.4	G												
			Masonry Anchorage Devices	2.3.5	G												
			Protective Coating	2.2.4	G												
			Steel Pan Stairs	2.2.2	G												
			Steel Stairs	2.3.1	G												
			Steel Stairs, Circular	2.3.2	G												
			SD-07 Certificates														
			Welding Procedures	1.3.1	G												
			Welder Qualification	1.3.1	G												
			SD-08 Manufacturer's Instructions														



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		05 51 00	Structural-Steel Plates, Shapes, and Bars	2.4.1	G													
			Structural-Steel Tubing	2.4.2	G													
			Hot-Rolled Carbon Steel Sheets and Strips	2.4.5	G													
			Cold-Finished Steel Bars	2.4.4	G													
			Hot-Rolled Carbon Steel Bars	2.4.3	G													
			Cold-Rolled Carbon Steel Sheets	2.4.6	G													
			Galvanized Carbon Steel Sheets	2.4.7	G													
			Cold-Drawn Steel Tubing	2.4.8	G													
			Gray Iron Castings	2.4.9	G													
			Malleable Iron Castings	2.4.10	G													
			Protective Coating	2.2.4	G													
			Masonry Anchorage Devices	2.3.5	G													
		05 51 33	SD-02 Shop Drawings															
			Ladders	2.3														
			Ship's Ladder	2.3.3														
			SD-03 Product Data															
			Ladders	2.3														
			Ship's Ladder	2.3.3														
			Ladder Safety Devices	2.3.2														
			SD-07 Certificates															
			Fabricator Certification for Ladder Assembly	1.3														
			Fabricator Certification for Ships Ladder Assembly	1.3														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		05 52 00	SD-02 Shop Drawings														
			Fabrication Drawings	1.2.1	G												
			Iron and Steel Hardware	3.2	G												
			Steel Shapes, Plates, Bars and Strips	3.2	G												
			SD-03 Product Data														
			Structural Steel Plates, Shapes, and Bars	2.2.1	G												
			Structural Steel Tubing	2.2.2	G												
			Cold-Finished Steel Bars	2.2.4	G												
			Hot-Rolled Carbon Steel Bars	2.2.3	G												
			Cold-Drawn Steel Tubing	2.2.5	G												
			Concrete Inserts	2.2.7	G												
			Masonry Anchorage Devices	2.2.8	G												
			Protective Coating	2.1.3	G												
			Steel Railings and Handrails	2.2.10	G												
			Aluminum Railings and Handrails	2.2.11	G												
			Anchorage and Fastening Systems	1.2.1	G												
			SD-07 Certificates														
			Welding Procedures	1.4.1	G												
			Welder Qualification	1.4.2	G												
			SD-08 Manufacturer's Instructions														
			Installation Instructions	3.2	G												
		06 10 00	SD-03 Product Data														
			Fire-retardant Treatment	1.8													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		06 10 00	Adhesives	2.2.2													
			SD-06 Test Reports														
			Preservative-treated	1.4.3													
			SD-07 Certificates														
			Certificates of Grade	1.9.1													
			Preservative Treatment	1.7													
		06 20 00	SD-02 Shop Drawings														
			Detail Drawings Indicating All	1.3	G												
			Wood Assemblies														
			SD-03 Product Data														
			Wood Products	2.2	G												
			Countertops	2.3	G												
			Treated Wood Products	1.4	G												
			Soffits	3.4	G												
			Hardware and Accessories	2.7	G												
			SD-04 Samples														
			Samples	1.5	G												
			SD-07 Certificates														
			Certificates of Grade	1.7.1.1	G												
			Certified Sustainably Harvested	1.7.1.2	G												
			Wood														
			Indoor Air Quality	1.7.1.3	G												
			SD-11 Closeout Submittals														
			Certified Sustainably Harvested	2.2.5	S												
			Softwood Plywood														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		06 20 00	Certified Sustainably Harvested Hardboard	2.2.7	S													
			VOC Content for Softwood Plywood	2.2.5	S													
			VOC Content for Hardwood Plywood	2.2.6	S													
			Indoor Air Quality for Non-aerosol Adhesives	2.8.1.2	S													
			Indoor Air Quality for Aerosol Adhesives	2.8.1.2	S													
		06 41 10	SD-02 Shop Drawings															
			Shop Drawings Installation	3.1.2 3.1	G													
			SD-03 Product Data															
			Laminated Plastic Covered	2.1.1														
			Hardware Finish	2.2.1														
			Certification	1.4														
			SD-04 Samples															
			Cabinet Hardware	2.2														
			Casework Hardware	2.2.2														
		06 61 16	SD-02 Shop Drawings															
			Solid Polymer Material	2.1.3	G													
			Solid Polymer Material	2.3	G													
			Solid Polymer Material	2.3.2	G													
			SD-03 Product Data															
			Solid Polymer Material	2.1.3														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		06 61 16	Solid Polymer Material	2.3														
			Solid Polymer Material	2.3.2														
			SD-04 Samples															
			Solid Polymer Material	2.1.3	G													
			Solid Polymer Material	2.3	G													
			Solid Polymer Material	2.3.2	G													
			SD-06 Test Reports															
			Solid Polymer Material	2.1.3														
			Solid Polymer Material	2.3														
			Solid Polymer Material	2.3.2														
			SD-08 Manufacturer's Instructions															
			Solid Polymer Material	2.1.3														
			Solid Polymer Material	2.3														
			Solid Polymer Material	2.3.2														
		07 05 23	SD-01 Preconstruction Submittals															
			Work Plan	1.4	G													
			SD-03 Product Data															
			Thermal Imaging Camera	2.2	G													
			SD-05 Design Data															
			Envelope Surface Area Calculations	3.2	G													
			SD-07 Certificates															
			Pressure Test Agency	1.6.2.1														
			Thermographer Qualifications	1.6.2.2														
			Test Instruments	1.6.3														
			Date Of Last Calibration	1.6.3														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		07 05 23	SD-06 Test Reports															
			Pressure Test Procedures	3.5	G													
			Air Leakage Test Report	3.5.8	G													
			Diagnostic Test Report	3.6.5	G													
		07 13 53	SD-03 Product Data															
			Manufacturer's Standard Details	1.3	G													
			Elastomeric Waterproofing Sheet Material	2.2	G													
			Primers, Adhesives, and Mastics	1.4	G													
			Primers, Adhesives, and Mastics	2.2	G													
			SD-06 Test Reports															
			Elastomeric Waterproofing Sheet Material	2.2	G													
			Field Quality Control	3.6	G													
			Protective Covering	3.7	G													
			SD-07 Certificates															
			Elastomeric Waterproofing Sheet Material	2.2														
			Primers, Adhesives, and Mastics	1.4	G													
			Primers, Adhesives, and Mastics	2.2	G													
			Protective Coverings	1.4	G													
			Special Warranties	1.8	G													
			Special Warranties	1.8	G													
			Certificates Of Compliance	2.1.1	G													
			Certificates Of Compliance	2.1.2	G													
			SD-08 Manufacturer's Instructions															

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		07 13 53	Primers, Adhesives, and Mastics	1.4	G												
			Primers, Adhesives, and Mastics	2.2	G												
			SD-11 Closeout Submittals														
			Certificates Of Compliance	2.1.1	G												
			Certificates Of Compliance	2.1.2	G												
		07 21 13	SD-03 Product Data														
			Manufacturer's Standard Details	1.3	G												
			Block or Board Insulation	2.2	G												
			Vapor Retarder	2.3	G												
			Pressure Sensitive Tape	2.4	G												
			Protection Board or Coatings	1.4	G												
			Accessories	2.6	G												
			SD-07 Certificates														
			Block or Board Insulation	2.2	G												
			Vapor Retarder	2.3	G												
			Protection Board or Coating	2.5	G												
			Protection Board or Coating	3.4.5	G												
			Special Warranties	1.8	G												
			Special Warranties	1.8	G												
			ULE Greenguard	1.5	G S												
			SD-08 Manufacturer's Instructions														
			Block or Board Insulation	2.2													
			Adhesive	2.6.1													
			SD-11 Closeout Submittals														
			ULE Greenguard	1.5	S												

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		07 21 13	Volatile Organic Compound (VOC) Content	2.1.1	S												
			Recycled Content	2.1.2	S												
		07 21 16	SD-03 Product Data														
			Blanket Insulation	2.2													
			Sill Sealer Insulation	2.3													
			Vapor Retarder	2.5													
			Pressure Sensitive Tape	2.6													
			Accessories	2.7													
			SD-08 Manufacturer's Instructions														
			Insulation	3.3.1													
			SD-11 Closeout Submittals														
			Recycled Content for Insulation Materials	2.1.1	S												
			Reduce Volatile Organic Compounds (VOC)	2.1.2	S												
		07 22 00	SD-02 Shop Drawings														
			Insulation Board Layout	1.3	G												
			Verification of Existing Conditions	1.3	G												
			SD-03 Product Data														
			Insulation	2.2	G												
			Cover Board	1.4	G												
			Fasteners	2.5	G												
			Moisture Control	2.4	G												
			SD-06 Test Reports														
			Flame Spread Rating	1.8.1	G												



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		07 22 00	SD-07 Certificates														
			Volatile Organic Compounds (VOC) Content	1.9	G												
			Installer Qualifications	1.6	G												
			Certificates Of Compliance For Felt Materials	1.6	G												
			SD-08 Manufacturer's Instructions														
			Fasteners	2.5	G												
			Insulation	2.2	G												
			SD-11 Closeout Submittals														
			Volatile Organic Compounds (VOC) Content	1.9	S												
		07 27 10	SD-04 Samples														
			Mock-Up	3.1.2	G												
			SD-06 Test Reports														
			Design Review Report	1.8	G DO												
			Testing and Inspection	3.1.3	G RO												
			SD-07 Certificates														
			Air Barrier Inspector	1.7	G RO												
		07 27 19.01	SD-01 Preconstruction Submittals														
			Qualifications of Manufacturer	1.8.1	G												
			Qualifications of Installer	1.8.2	G												
			SD-02 Shop Drawings														
			Self-adhering Air Barrier	1.4	G												
			SD-03 Product Data														
			Self-adhering Air Barrier	1.4	G												

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																		(g)
		07 27 19.01	Primers, Adhesives, and Mastics	2.2	G													
			Safety Data Sheets	1.4.2	G													
			SD-04 Samples															
			Self-adhering Air Barrier	1.4	G													
			SD-06 Test Reports															
			Field Peel Adhesion Test	1.6	G													
			Flame Propagation of Wall Assemblies	1.4.4	G													
			Flame Spread and Smoke Developed Index Ratings	1.4.4	G													
			Site Inspections and Testing	3.4.1	G													
			SD-07 Certificates															
			Self-adhering Air Barrier	1.4	G													
			Qualifications of Manufacturer	1.8.1	G													
			Qualifications of Installer	1.8.2	G													
			SD-08 Manufacturer's Instructions															
			Self-adhering Air Barrier	1.4	G													
			Primers, Adhesives, and Mastics	2.2	G													
		07 27 26	SD-01 Preconstruction Submittals															
			Qualifications of Manufacturer	1.9.1	G													
			Qualifications of Installer	1.9.2	G													
			SD-02 Shop Drawings															
			Fluid-Applied Membrane Air Barrier	1.4	G													
			SD-03 Product Data															

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		07 27 26	Fluid-Applied Membrane Air Barrier	1.4	G													
			Transition Membrane	2.4	G													
			Primers, Adhesives, and Mastics	2.3	G													
			Reinforcement	2.7	G													
			Safety Data Sheets	1.4.2	G													
			SD-04 Samples															
			Mockup	1.4.3	G													
			SD-06 Test Reports															
			Capillary Moisture Test	1.6	G													
			Field Peel Adhesion Test	1.4.4	G													
			Flame Propagation of Wall Assemblies	1.4.4	G													
			Flame Spread and Smoke Developed Index Ratings	1.4.4	G													
			Site Inspections	3.4.1	G													
			SD-07 Certificates															
			Fluid-Applied Membrane Air Barrier	1.4	G													
			Transition Membrane	2.4	G													
			Qualifications of Manufacturer	1.9.1	G													
			Qualifications of Installer	1.9.2	G													
			SD-08 Manufacturer's Instructions															
			Fluid-Applied Membrane Air Barrier	1.4	G													
			Transition Membrane	2.4	G													

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		07 27 26	Primers, Adhesives, and Mastics	2.3	G													
			SD-11 Closeout Submittals															
			Volatile Organic Compound (VOC) Content	2.1	S													
		07 41 13	SD-02 Shop Drawings															
			Roofing Panels	1.4.5	G													
			Flashing and Accessories	1.4.5	G													
			Gutter/Downspout Assembly	1.4.5	G													
			SD-03 Product Data															
			Roof Panels	2.1	G													
			Factory-Applied Color Finish	1.4.5	G													
			Accessories	2.4	G													
			Fasteners	1.4.5	G													
			Pressure Sensitive Tape	1.4.5	G													
			Underlayments	2.7	G													
			Gaskets and Sealing/Insulating Compounds	2.8	G													
			Coil Stock	1.4.5	G													
			Galvanizing Repair Paint	1.4.5	G													
			SD-04 Samples															
			Roof Panels	2.1	G													
			Factory-applied Color Finish	1.4.5	G													
			Accessories	2.4	G													
			Fasteners	1.4.5	G													
			Gaskets and Sealant/Insulating Compounds	1.4.5	G													

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		07 41 13	SD-05 Design Data															
			Wind Uplift Resistance	1.2.1.2	G													
			SD-06 Test Reports															
			Leakage Test Report	1.2.1.1	G													
			Wind Uplift Test Report	1.2.1.2	G													
			Fire Rating Test Report	2.6.2	G													
			Factory Finish and Color	2.2	G													
			Performance Requirements															
			SD-07 Certificates															
			Roof Panels	2.1	G													
			Coil Stock Compatibility	1.4.5	G													
			Self-Adhering Modified Bitumen	2.7.1	G													
			Underlayment															
			Qualification of Manufacturer	1.4.1	G													
			Qualification of Applicator	1.4.2	G													
			SD-08 Manufacturer's Instructions															
			Insulation	2.6	G													
			Installation Manual	1.4.5	G													
			SD-11 Closeout Submittals															
			Warranties	1.8	G													
			Information Card	3.11	G													
		07 41 16	SD-03 Product Data															
			Soffit panels	2.1	G													
			Closures	3.1.1														
			flashing	3.1.1														
			Accessories	2.3														

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		07 41 16	Fasteners	2.4														
			Gaskets and Insulating Compounds	2.6														
			SD-04 Samples															
			SOFFIT PANEL	2.1														
			Accessories	2.3														
			Fasteners	2.4														
			Gaskets and Insulating Compounds	2.6														
			Sealant	2.5	G													
			SD-06 Test Reports															
			Salt Spray Test	2.2.1														
			SD-07 Certificates															
			Accessories	2.3														
			SD-08 Manufacturer's Instructions															
			INSTALLATION	3.1	G													
		07 60 00	SD-02 Shop Drawings															
			Exposed Sheet Metal	2.2.1	G													
			Gutters	3.1.17	G													
			Downspouts	3.1.18	G													
			Expansion Joints	3.1.26	G													
			Gravel Stops and Fasciae	2.2.1	G													
			Splash Pans	3.1.22	G													
			Flashing for Roof Drains	3.1.19	G													
			Base Flashing	3.1.11	G													
			Counterflashing	3.1.12	G													

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		07 60 00	Flashing at Roof Penetrations and Equipment Supports	3.1.27	G												
			Reglets	2.2.15	G												
			Scuppers	3.1.20	G												
			Copings	3.1.30	G												
			Drip Edges	3.1.16	G												
			Conductor Heads	3.1.21	G												
			Open Valley Flashing	3.1.23	G												
			Eave Flashing	3.1.24	G												
			SD-03 Product Data														
			Cool Roof	2.2.12	G S												
			SD-04 Samples														
			Finish Samples	1.4.2	G												
			SD-07 Certificates														
			Certificates of Compliance	2.1	G												
			SD-08 Manufacturer's Instructions														
			Instructions for Installation	1.4.3	G												
			Quality Control Plan	3.5	G												
			SD-10 Operation and Maintenance Data														
			Cleaning and Maintenance	1.4.3	G												
			SD-11 Closeout Submittals														
			Recycled Content	2.1	S												
		07 84 00	SD-02 Shop Drawings														
			Firestopping System	2.1	G												
			SD-03 Product Data														

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		07 84 00	Firestopping Materials	2.2	G													
			SD-06 Test Reports															
			Inspection	3.3	G													
			SD-07 Certificates															
			Inspector Qualifications	1.5.2														
			Firestopping Materials	2.2														
			Installer Qualifications	1.5.1	G													
		07 92 00	SD-03 Product Data															
			Sealants	2.2	G													
			Primers	2.3	G													
			Bond Breakers	2.4	G													
			Backstops	2.5	G													
			SD-06 Test Reports															
			Field Adhesion	3.1	G													
			SD-07 Certificates															
			Indoor Air Quality	1.4.1	G													
			SD-11 Closeout Submittals															
			Indoor Air Quality For Interior	2.2.1	S													
			Sealants															
			Indoor Air Quality For Interior	2.2.3	S													
			Floor Joint Sealants															
			Indoor Air Quality For Interior	2.2.4	S													
			Acoustical Sealants															
			Indoor Air Quality For Interior	2.6	S													
			Caulking															
		08 11 13	SD-02 Shop Drawings															



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																		(g)
		08 11 13	Doors	2.1	G													
			Doors	2.1	G													
			Frames	2.7	G													
			Frames	2.7	G													
			Accessories	2.5														
			Weatherstripping	2.9														
			SD-03 Product Data															
			Doors	2.1	G													
			Frames	2.7	G													
			Accessories	2.5														
			Weatherstripping	2.9														
		08 33 23	SD-02 Shop Drawings															
			Overhead Coiling Doors	2.2.1														
			Counterbalancing Mechanism	2.2.3														
			Manual Door Operators	2.2.4														
			Electric Door Operators	2.2.5														
			Bottom Bars	2.2.1.2														
			Guides	2.1.1.1														
			Mounting Brackets	2.2.3.1														
			Overhead Drum	2.2.1.9														
			Hood	3.3.2														
			Installation Drawings	2.1.1.1														
			SD-03 Product Data															
			Overhead Coiling Doors	2.2.1														
			Hardware	2.2.2														
			Counterbalancing Mechanism	2.2.3														

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		08 33 23	Manual Door Operators	2.2.4													
			Electric Door Operators	2.2.5													
			SD-05 Design Data														
			Overhead Coiling Doors	2.2.1													
			Hardware	2.2.2													
			Counterbalancing Mechanism	2.2.3													
			Manual Door Operators	2.2.4													
			Electric Door Operators	2.2.5													
			SD-10 Operation and Maintenance Data														
			Operation and Maintenance Manuals	3.3.2	G												
			Materials	3.3.2													
			Devices	3.3.2													
			Procedures	3.3.2													
			Manufacture's Brochures	3.3.2													
			Parts Lists	3.3.2	G												
			SD-11 Closeout Submittals														
			Warranty	3.3.1	G												
		08 34 59	SD-02 Shop Drawings														
			Vault Door Unit	2.1	G												
			SD-03 Product Data														
			Vault Door and Frame	2.2													
			SD-07 Certificates														
			Vault Door and Frame	2.2													
			SD-08 Manufacturer's Instructions														

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		08 34 59	Installation	3.1														
			SD-11 Closeout Submittals															
			LEED Documentation	1.2														
		08 51 13	SD-02 Shop Drawings															
			Windows	2.2	G													
			Fabrication Drawings	1.10														
			SD-03 Product Data															
			Windows	2.2	G													
			Hardware	2.3.8.1	G													
			Fasteners	2.3.3	G													
			Window Performance	1.11	G													
			Thermal-Barrier Windows	2.5	G													
			Mullions	2.6	G													
			Window Cleaners' Bolts	2.7	G													
			Screens	2.3.10	G													
			Weatherstripping	2.3.2	G													
			Accessories	2.3.8	G													
			Adhesives	2.3.4														
			Thermal Performance	1.11.5	G													
			SD-04 Samples															
			Finish Sample	1.4.2.1														
			Window Sample	1.4.2.2														
			SD-05 Design Data															
			Structural Calculations for	2.2	G													
			Deflection															
			Design Analysis	1.4.3	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		08 51 13	SD-06 Test Reports														
			Minimum Condensation Resistance Factor	1.4.4													
			Resistance to Forced Entry Standard Airblast Test	1.4.4 1.11.2.3													
			SD-10 Operation and Maintenance Data														
			Windows	2.2	G												
			Plastic Identification	1.7													
			SD-11 Closeout Submittals														
			Recycled Content of Aluminum Windows	2.1.1	S												
		08 60 45	SD-02 Shop Drawings														
			Shop Drawings	3.2	G												
			SD-03 Product Data														
			Skylights and Translucent Panels Warranty	2.2 1.6	G												
			SD-06 Test Reports														
			Test Reports	2.2													
			SD-07 Certificates														
			Systems	2.6													
			Qualifications	1.4													
			SD-11 Closeout Submittals														
			Recycled Content for Aluminum Framing	2.1.1	S												
		08 71 00	SD-02 Shop Drawings														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		08 71 00	Hardware Schedule	1.4	G												
			Keying System	2.3.6	G												
			SD-03 Product Data														
			Hardware Items	2.3	G												
			SD-08 Manufacturer's Instructions														
			Installation	3.1													
			SD-10 Operation and Maintenance Data														
			Hardware Schedule	1.4	G												
			SD-11 Closeout Submittals														
			Key Bitting	1.5.1													
		08 81 00	SD-02 Shop Drawings														
			Installation	3.3.1	G												
			SD-03 Product Data														
			Insulating Glass	1.6.1													
			Glazing Accessories	1.3													
			SD-04 Samples														
			Insulating Glass	1.6.1													
			Plastic Sheet	3.2.7													
			Glazing Compound	2.4.2													
			Tape	2.4.5													
			Sealant	2.4.3.1													
			SD-07 Certificates														
			Insulating Glass	1.6.1													
			SD-08 Manufacturer's Instructions														
			Setting and Sealing Materials	2.4													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		08 81 00	Glass Setting	3.2														
		08 91 00	SD-02 Shop Drawings															
			Wall louvers	1.4														
			Wall louvers	1.5														
			SD-03 Product Data															
			Metal Wall Louvers	2.2														
			SD-04 Samples															
			Wall louvers	1.4	G													
			Wall louvers	1.5	G													
			Door louvers	1.5	G													
			Door louvers	2.3	G													
		09 22 00	SD-02 Shop Drawings															
			Metal support systems	2.1	G													
		09 29 00	SD-03 Product Data															
			Cementitious Backer Units	2.2.7														
			Glass Mat Water-Resistant	2.2.4														
			Gypsum Tile Backing Board															
			Water-Resistant Gypsum Backing Board	2.2.3														
			Glass Mat Covered or Reinforced Gypsum Sheathing	2.2.5														
			Glass Mat Covered or Reinforced Gypsum Sheathing Sealant	2.2.5.1														
			Abuse Resistant Gypsum Board	2.2.6														
			Accessories	2.2.13														
			Certifications	1.3														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		09 29 00	Gypsum Board	2.2.1														
			SD-07 Certificates															
			Asbestos Free Materials	2.2	G													
			Indoor Air Quality	1.3.1	G													
			SD-11 Closeout Submittals															
			Recycled Content for Gypsum Board	2.2.1	S													
			Recycled Content for Paper Facing and Gypsum Cores	2.2.1	S													
			Indoor Air Quality for Gypsum Board	2.2.1	S													
			VOC Content of Joint Compound	2.2.8	S													
			Indoor Air Quality for Non-aerosol Adhesives	2.2.10	S													
			Indoor Air Quality for Aerosol Adhesives	2.2.10	S													
		09 30 10	SD-02 Shop Drawings															
			Detail Drawings	3.2	G													
			SD-03 Product Data															
			Porcelain Tile	2.1.1	G													
			Glazed Wall Tile	2.1.2	G													
			Setting-Bed	2.2	G													
			Mortar, Grout, and Adhesive	2.4	G													
			Reinforcing Wire Fabric	2.2.6	G													
			SD-04 Samples															
			Tile	2.1	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		09 30 10	Accessories	2.1	G													
			Accessories	2.1.3	G													
			Transition Strips	2.1	G													
			Transition Strips	2.6	G													
			Grout	2.4.3	G													
			SD-07 Certificates															
			Indoor Air Quality	1.3.1														
			SD-08 Manufacturer's Instructions															
			Maintenance Instructions	3.7														
			SD-10 Operation and Maintenance Data															
			Installation	3.2	G													
			SD-11 Closeout Submittals															
			Recycled Content for Porcelain Tile	2.1.1	S													
			Recycled Content For Glazed Wall Tile	2.1.2														
			Indoor Air Quality For Adhesives	2.4														
			Indoor Air Quality For Sealants	2.4.7														
		09 51 00	SD-02 Shop Drawings															
			Approved Detail Drawings	1.2	G RO													
			SD-03 Product Data															
			Acoustical Ceiling Systems	1.2.4	G RO													
			SD-04 Samples															
			Acoustical Units	2.1	G RO													
			Acoustic Ceiling Tiles	2.1.1	G RO													



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		09 51 00	SD-06 Test Reports															
			Ceiling Attenuation Class and Test	1.2.1	G RO													
			SD-07 Certificates															
			Acoustical Units	2.1	G RO													
			Acoustic Ceiling Tiles	2.1.1	G RO													
		09 65 00	SD-02 Shop Drawings															
			Resilient Flooring and Accessories	2.8	G													
			SD-03 Product Data															
			Resilient Flooring and Accessories	2.8	G													
			Adhesives	2.4														
			Wall Base	2.2														
			SD-04 Samples															
			Resilient Flooring and Accessories	2.8	G G													
			SD-06 Test Reports															
			Moisture, Alkalinity and Bond Tests	3.3	G													
			SD-08 Manufacturer's Instructions															
			Surface Preparation	3.2	G													
			Installation	3.1	G													
			Luxury Vinyl Tile	2.1														
			SD-10 Operation and Maintenance Data															

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		09 65 00	Resilient Flooring and Accessories	2.8	G G												
			SD-11 Closeout Submittals														
			LEED Documentation	1.3													
		09 67 23	SD-02 Shop Drawings														
			Installation Drawings	2.1	G												
			SD-03 Product Data														
			Manufacturer's Catalog Data	1.2.1	G												
			SD-04 Samples														
			Hardboard Mounted Epoxy Flooring	1.5.2	G												
			Floor Topping	3.1.4	G												
			SD-05 Design Data														
			Design Mix Data	1.2.2	G												
			SD-07 Certificates														
			Listing of Product Installations	1.5.1	G												
			Referenced Standards	1.5	G												
			Certificates														
			SD-11 Closeout Submittals														
			Warranty	1.6	G												
		09 68 00	SD-02 Shop Drawings														
			Installation Drawings	3.4	G												
			SD-03 Product Data														
			Carpet	2.1	G												
			Moldings	2.4	G												
			SD-04 Samples														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		09 68 00	Carpet	2.1	G													
			Moldings	2.4	G													
			SD-06 Test Reports															
			Moisture and Alkalinity Tests	3.2	G													
			SD-07 Certificates															
			Carpet	2.1														
			Regulatory Requirements	1.4														
			SD-08 Manufacturer's Instructions															
			Surface Preparation	3.1														
			Installation	3.4														
			SD-10 Operation and Maintenance Data															
			Carpet	2.1	G													
			Cleaning and Protection	3.5	G													
			SD-11 Closeout Submittals															
			LEED Documentation	1.2														
		09 84 20	SD-02 Shop Drawings															
			Approved Detail Drawings	2.2	G													
			SD-03 Product Data															
			Installation	3.2														
			Acoustical Wall Panels	2.2	G													
			SD-04 Samples															
			Acoustical Wall Panels	2.2	G													
			SD-07 Certificates															
			Acoustical Wall Panels	2.2														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION	
																		(g)
		09 84 20	Certified Sustainably Harvested Wood	1.3.1	S													
			SD-11 Closeout Submittals Warranty	1.5														
		09 90 00	SD-02 Shop Drawings															
			Piping identification stencil	3.10	G													
			SD-03 Product Data															
			Coating	2.1	G													
			Manufacturer's Technical Data Sheets	2.1														
			SD-04 Samples															
			Color	1.10	G													
			SD-07 Certificates															
			Applicator's qualifications	1.3														
			Qualification Testing	1.4.1.2	G													
			SD-08 Manufacturer's Instructions															
			Application instructions	3.2.1														
			Mixing	3.6.2														
			Manufacturer's Material Safety Data Sheets	1.7.2														
			SD-10 Operation and Maintenance Data															
			Coatings:	2.1	G													
		10 11 00	SD-03 Product Data															
			Visual Display Board	1.2	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		10 11 00	SD-04 Samples														
			Aluminum	2.1.4	G												
			Porcelain Enamel	2.1.1	G												
			Materials	2.1	G												
			SD-07 Certificates														
			Visual Display Board	1.2													
		10 21 13	SD-02 Shop Drawings														
			Fabrication Drawings	2.1													
			Installation Drawings	3.3	G												
			SD-03 Product Data														
			Cleaning and Maintenance Instructions	2.1													
			Colors And Finishes	2.7													
			Galvanized Steel Sheet	2.2.1													
			Sound-Deadening Cores	2.2.2													
			Anchoring Devices and Fasteners	2.2.3													
			Hardware and Fittings	2.2.5													
			Brackets	2.2.4													
			Door Hardware	2.2.6													
			Pilaster Shoes	2.5													
			Finishes	2.2.5.2	G												
			Toilet Enclosures	2.3.1													
			Urinal Screens	2.3.2													
			SD-04 Samples														
			Colors and Finishes	2.7	G												
			Hardware and Fittings	2.2.5													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION	
																		(g)
		10 21 13	Anchoring Devices and Fasteners	2.2.3														
			SD-07 Certificates															
			Warranty	1.6														
			Indoor Air Quality	1.3.1	G													
			SD-11 Closeout Submittals															
			Recycled content for stainless steel partitions and screens	2.3	S													
		10 26 13	SD-02 Shop Drawings															
			Corner Guards	2.2	G RO													
			SD-03 Product Data															
			Corner Guards	2.2	G RO													
			SD-04 Samples															
			Finish	2.4	G RO													
			SD-06 Test Reports															
			Corner Guards	2.2														
			SD-07 Certificates															
			Corner Guards	2.2														
		10 28 13	SD-03 Product Data															
			Finishes	2.1.2	G													
			Accessory Items	2.2	G													
			SD-04 Samples															
			Finishes	2.1.2														
			Accessory Items	2.2														
			SD-07 Certificates															
			Accessory Items	2.2														
		10 51 13	SD-02 Shop Drawings															

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		10 51 13	Types	2.1	G												
			Location	1.4	G												
			Installation	3.1													
			SD-03 Product Data														
			Material	2.2													
			Locking Devices	2.3.1													
			Handles	2.3.4													
			Finish	2.2.3													
			components	2.3													
			Assembly	3.1													
			SD-04 Samples														
			Color chips	1.5.1	G												
		10 56 13	SD-01 Preconstruction Submittals														
			Shelving Units	2.1													
			SD-03 Product Data														
			Shelving Units	2.1													
			Accessories	2.2													
			Installation instructions	3.2													
			SD-04 Samples														
			Finish	2.3													
			SD-06 Test Reports														
			Shelving Units	2.1													
			Finish	2.3													
		12 24 13	SD-02 Shop Drawings														
			Installation	3.3	G DO												
			SD-03 Product Data														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		12 24 13	Window Shades Certification	2.1	G DO													
			SD-04 Samples	1.4.6														
			Window Shades	2.1	G DO													
			SD-06 Test Reports															
			Window Shades	2.1														
			SD-08 Manufacturer's Instructions															
			Window Shades	2.1														
			SD-10 Operation and Maintenance Data															
			Window Shades	2.1														
			SD-11 Closeout Submittals															
			Local/Regional Materials (LEED)	1.1														
			Shade Cloth (LEED)	1.4.5														
		12 48 13	SD-02 Shop Drawings															
			Installation Drawings	3.2	G													
			Detail Drawings	3.2	G													
			Custom Graphics Drawings	3.2	G													
			SD-03 Product Data															
			Entrance Floor Mats and Frames	2.1.1	G													
			Adhesives and Concrete Primers	2.1.2	G													
			SD-04 Samples															
			Entrance Floor Mats and Frames	2.1.1	G													
			Custom Graphics	2.1.1	G													
			SD-08 Manufacturer's Instructions															
			Manufacturer's Instructions	3.2														



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		12 48 13	SD-10 Operation and Maintenance Data														
			Protection, Maintenance, and Repair Information	3.2													
		13 34 19	SD-01 Preconstruction Submittals														
			Manufacturer's Qualifications	1.6.3	G												
			SD-02 Shop Drawings														
			Detail Drawings	1.2.1.8	G												
			Detail Drawings	1.6.1	G												
			SD-03 Product Data														
			sustainable acquisition compliance	2.4.4	G												
			Manufacturer's catalog data	1.6.1	G												
			SD-04 Samples														
			Coil Stock	1.6.1	G												
			Coil Stock	2.1.8	G												
			Roof Panels	1.2.1.10	G												
			Wall Panels	1.2.1.10	G												
			Fasteners	2.5.2	G												
			Metal Closure Strips	2.8.1	G												
			Insulation	1.4.7	G												
			Insulation	2.4.3	G												
			Vapor Barrier	1.6.10	G												
			Manufacturer's color charts and chips	2.4.5	G												
			SD-05 Design Data														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		13 34 19	descriptive and technical literature	1.6.1	G													
			building design analysis	1.6.1	G													
			SD-06 Test Reports															
			test reports	1.6.1	G													
			Coatings and base metals	1.6.1	G													
			Factory Color Finish Performance Requirements	1.6.1	G													
			SD-07 Certificates															
			system components	1.6.1	G													
			Coil Stock	1.6.1	G													
			Coil Stock	2.1.8	G													
			Aluminized Steel Repair Paint	1.6.1	G													
			Galvanizing Repair Paint	1.6.1	G													
			Enamel Repair Paint	1.6.1	G													
			Qualification of Manufacturer	1.6.1	G													
			Qualification of Erector	1.6.1	G													
			SD-08 Manufacturer's Instructions															
			Installation of Roof and Wall panels	1.6.2	G													
			shipping, handling, and storage	1.7	G													
			SD-11 Closeout Submittals															
			Manufacturer's Warranty	3.14.1	G													
			Contractor's Warranty for Installation	3.14.2	G													
		13 48 00	SD-02 Shop Drawings															

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Ground Transportation Equipment Building (GTEB), Fort Huachuca

CONTRACTOR

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		13 48 00	Bracing	3.1	G PO													
			Resilient Vibration Isolation Devices	3.4	G PO													
			Equipment Requirements	2.1	G PO													
			SD-03 Product Data															
			Bracing	3.1	G PO													
			Equipment Requirements	2.1	G PO													
			SD-06 Test Reports															
			Anchor Bolts	3.3	G PO													
		13 48 00.10	SD-02 Shop Drawings															
			Coupling and Bracing	3.1	G													
			Flexible Couplings or Joints	3.3	G													
			Equipment Requirements	2.1	G													
			Contractor Designed Bracing	1.2.4	G													
			SD-03 Product Data															
			Coupling and Bracing	3.1	G													
			Equipment Requirements	2.1	G													
			Contractor Designed Bracing	1.2.4	G													
			SD-07 Certificates															
			Flexible Ball Joints	2.3														
		13 48 56	SD-01 Preconstruction Submittals															
			Bridge Manufacturer's Qualifications	1.4.1.1	G													
			Manufacturer's Descriptive and Technical Literature	1.4.1.2	G													
			Detailed Design Drawings	1.4.1.3	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		13 48 56	Manufacture's design analysis	1.4.1.4	G												
			Representative Design	1.4.1.5	G												
			Calculations														
			Splicing and Erection Procedures	1.4.1.6	G												
			Warranty Information	1.4.1.7	G												
			Inspection and Maintenance	1.4.1.8	G												
			Procedures														
			Welder Qualifications	1.4.1.9	G												
		21 13 13	SD-02 Shop Drawings														
			Shop Drawings	1.4.3	G												
			As-Built Drawings	3.9													
			SD-03 Product Data														
			Fire Protection Related	1.4.1													
			Submittals														
			Materials and Equipment	2.3	G												
			Spare Parts	1.6													
			Preliminary Tests	3.8	G												
			Final Acceptance Test	3.9	G												
			Onsite Training	3.10	G												
			Fire Protection Specialist	1.4.1	G												
			Sprinkler System Installer	1.4.2	G												
			SD-05 Design Data														
			Sway Bracing	1.4.3	G												
			Hydraulic Calculations	1.2.1.3	G												
			SD-06 Test Reports														
			Preliminary Test Report	3.8													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		21 13 13	Final Acceptance Test Report	3.9														
			SD-07 Certificates															
			Inspection by Fire Protection Specialist	3.3														
			SD-10 Operation and Maintenance Data															
			Operating and Maintenance Manuals	3.10	G													
		22 00 00	SD-02 Shop Drawings															
			Plumbing System	3.9.1	G													
			SD-03 Product Data															
			Fixtures	2.5														
			Flush Valve Water Closets	2.5.2														
			Countertop Lavatories	2.5.4														
			Kitchen Sinks	2.5.5														
			Service Sinks	2.5.6														
			Water Heaters	2.10	G													
			Pumps	2.12	G													
			Backflow Prevention Assemblies	3.9.1.1	G													
			Welding	1.5.1														
			Vibration-Absorbing Features	3.4	G													
			Plumbing System	3.9.1														
			SD-06 Test Reports															
			Tests, Flushing and Disinfection	3.9														
			Test of Backflow Prevention Assemblies	3.9.1.1	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		22 00 00	SD-07 Certificates														
			Materials and Equipment	1.3													
			Bolts	2.2.1													
			SD-10 Operation and Maintenance Data														
			Plumbing System	3.9.1	G												
			SD-11 Closeout Submittals														
			Water-Efficient Products	2.1.1	S												
			Energy-Efficient Water Heaters	2.1.2	S												
		22 31 00	SD-02 Shop Drawings														
			Installation	3.2													
			SD-03 Product Data														
			Softening Equipment	2.2													
			Spare Parts	1.4													
			Field Instructions	3.3.2													
			SD-06 Test Reports														
			Softening Equipment	2.2													
			Piping	3.4.2													
			SD-10 Operation and Maintenance Data														
			Operating and Maintenance Instructions	3.3.2	G												
		23 00 00	SD-02 Shop Drawings														
			Detail Drawings	1.4.5	G												
			SD-03 Product Data														
			Metallic Flexible Duct	2.10.1.1													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		23 00 00	Insulated Nonmetallic Flexible Duct Runouts	2.10.1.2													
			Duct Connectors	2.10.1.2													
			Duct Access Doors	2.10.2	G												
			Manual Balancing Dampers	2.10.3	G												
			Diffusers	2.10.6.1													
			Registers and Grilles	2.10.6.2													
			Louvers	2.10.7													
			Air Vents, Penthouses, and Goosenecks	2.10.8													
			Centrifugal Fans	2.11.1.1													
			In-Line Centrifugal Fans	2.11.1.2													
			Panel Type Power Wall Ventilators	2.11.1.3													
			Air Handling Units	2.12	G												
			Variable Volume, Single Duct Terminal Units	2.15.1.1	G												
			Reheat Units	2.15.1.2	G												
			Radiant Heaters	2.13	G												
			Unit Heaters	2.14													
			Unit Heaters	3.3.2													
			Diagrams	1.2.1.2	G												
			SD-06 Test Reports														
			Performance Tests	3.13	G												
			Damper Acceptance Test	3.11	G												
			SD-07 Certificates														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 00 00	Bolts	1.4.1														
			Certification	1.4.6														
			Ozone Depleting Substances	1.4.3														
			SD-08 Manufacturer's Instructions															
			Manufacturer's Installation Instructions	3.3														
			Operation and Maintenance Training	3.15.2														
			SD-10 Operation and Maintenance Data															
			Operation and Maintenance Manuals	3.15.1	G													
			Manual Balancing Dampers	2.10.3	G													
			Centrifugal Fans	2.11.1.1	G													
			In-Line Centrifugal Fans	2.11.1.2	G													
			Panel Type Power Wall Ventilators	2.11.1.3	G													
			Air Handling Units	2.12	G													
			Reheat Units	2.15.1.2	G													
			Radiant Heaters	2.13	G													
			Unit Heaters	2.14														
			Unit Heaters	3.3.2														
			SD-11 Closeout Submittals															
			Energy Efficient Equipment	2.1.1	S													
			Reduce Volatile Organic Compounds (VOC)	2.1.2	S													



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(g)
		23 00 00	Indoor Air Quality During Construction	3.1	S													
			Ozone Depleting Substances for Refrigerants	2.1.3	S													
		23 05 15	SD-01 Preconstruction Submittals															
			Material, Equipment, and Fixture Lists	1.2	G													
			SD-02 Shop Drawings															
			Record Drawings	1.2	G													
			Connection Diagrams	1.2	G													
			Coordination Drawings	1.2	G													
			Fabrication Drawings	1.2	G													
			Installation Drawings	3.1	G													
			SD-03 Product Data															
			Pipe and Fittings	2.1	G													
			Piping Specialties	2.2	G													
			Valves	2.3	G													
			Miscellaneous Materials	2.4	G													
			Supporting Elements	2.5	G													
			Equipment Foundation Data	1.2	G													
			SD-04 Samples															
			Manufacturer's Standard Color Charts	1.2	G													
			SD-05 Design Data															
			Pipe and Fittings	2.1	G													
			Piping Specialties	2.2	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 05 15	Valves	2.3	G													
			SD-06 Test Reports															
			Hydrostatic Tests	3.1	G													
			Air Tests	3.1	G													
			Valve-Operating Tests	3.1	G													
			Drainage Tests	3.1	G													
			Pneumatic Tests	3.1	G													
			Non-Destructive Electric Tests	3.1	G													
			System Operation Tests	3.1	G													
			SD-07 Certificates															
			Record of Satisfactory Field Operation	1.4.2	G													
			List of Qualified Permanent Service Organizations	1.4.3	G													
			Listing of Product Installations	1.2	G													
			Records of Existing Conditions	1.2	G													
			Surface Resistance	3.1	G													
			Shear and Tensile Strengths	3.1	G													
			Temperature Ratings	3.1	G													
			Bending Tests	3.1	G													
			Flattening Tests	3.1	G													
			Transverse Guided Weld Bend Tests	3.1	G													
			SD-10 Operation and Maintenance Data															

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(g)
		23 05 15	Operation and Maintenance Manuals	3.10	G													
		23 05 93	SD-01 Preconstruction Submittals															
			Records of Existing Conditions	1.3.3	G RO													
			TAB Firm	1.5.3.1	G RO													
			TAB Team Assistants	1.2	G RO													
			TAB Team Engineer	1.2	G RO													
			TAB Specialist	1.5.3.2	G RO													
			TAB Team Field Leader	1.2	G RO													
			SD-02 Shop Drawings															
			TAB Schematic Drawings and Report Forms	1.3.3	G RO													
			SD-03 Product Data															
			Equipment and Performance Data	1.3	G RO													
			TAB Related HVAC Submittals	1.5.3.4	G RO													
			TAB Procedures	1.5.2	G RO													
			Calibration	1.5.2	G RO													
			Systems Readiness Check	1.3.3	G RO													
			TAB Execution	1.5.4	G RO													
			TAB Verification	1.5.4.3	G RO													
			SD-06 Test Reports															
			Completed Pre-Final DALT Report	3.3.5	G													
			Certified Final DALT Report	3.3.8	G													
			TAB Design Review Report	1.6.2.1	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 05 93	TAB Report for Season 1	1.5.5.2	G													
			TAB Report for Season 2	1.5.5.2	G													
			SD-07 Certificates															
			Independent TAB Agency and Personnel Qualifications	1.5.1	G PO													
			DALT and TAB Submittal and Work Schedule	1.6.2	G PO													
			TAB Pre-Field Engineering Report	1.6.2.3	G PO													
			TAB Firm	1.5.3.1	G PO													
			Design Review Report	1.3.3	G PO													
			Pre-field DALT Preliminary Notification	1.6.2.2	G													
			Advanced Notice for Season 1 TAB Field Work	1.6.2	G PO													
			Prerequisite HVAC Work Check Out List For Season 1	1.6.2	G PO													
			Advanced Notice for Season 2 TAB Field Work	1.6.2	G PO													
			Prerequisite HVAC Work Check Out List For Season 2	1.6.2	G PO													
		23 07 00	SD-02 Shop Drawings															
			MICA Plates	3.2.2.4	G PO													
			Pipe Insulation Systems	2.4														
			Pipe Insulation Systems	3.2														
			Duct Insulation Systems	3.3														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(g)
		23 07 00	Equipment Insulation Systems	3.4														
			SD-03 Product Data															
			Pipe Insulation Systems	2.4	G PO													
			Pipe Insulation Systems	3.2	G PO													
			Duct Insulation Systems	3.3	G PO													
			Equipment Insulation Systems	3.4	G PO													
			SD-04 Samples															
			Thermal Insulation	2.3.1.3	G PO													
			Display Samples	3.1.1	G PO													
			SD-08 Manufacturer's Instructions															
			Pipe Insulation Systems	2.4	G PO													
			Pipe Insulation Systems	3.2	G PO													
			Duct Insulation Systems	3.3	G PO													
			Equipment Insulation Systems	3.4	G PO													
			SD-11 Closeout Submittals															
			Reduce Volatile Organic Compounds (VOC)	2.1.1	S													
			Recycled Content	2.1.2	S													
		23 09 00	SD-02 Shop Drawings															
			DDC Contractor Design Drawings	3.2	G													
			Draft As-Built Drawings	3.2	G													
			Final As-Built Drawings	3.2	G													
			SD-03 Product Data															
			Certificate of Networkiness Documentation	1.8.7	G													
			Programming Software	1.8.1	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		23 09 00	Controller Application Programs	1.8.2	G												
			Configuration Software	1.8.1	G												
			Manufacturer's Product Data	2.2	G												
			XIF files	2.2.1	G												
			Draft LNS Database	3.4.3	G												
			Final LNS Database	3.5.4	G												
			LNS Plug-ins	1.8.3	G												
			Niagara Framework Supervisory Gateway Backups	1.8.5	G												
			Niagara Framework Engineering Tool	1.8.6	G												
			Niagara Framework Wizards	1.8.4	G												
			SD-06 Test Reports														
			Start-Up Testing Report	3.4.2	G												
			PVT Procedures	3.5.1	G												
			PVT Report	3.5.3	G												
			Pre-Construction Quality Control (QC) Checklist	1.9.1	G												
			Post-Construction Quality Control (QC) Checklist	1.9.2	G												
			SD-10 Operation and Maintenance Data														
			Operation and Maintenance (O&M) Instructions	3.6	G												
			Training Documentation	3.7.1	G												
			SD-11 Closeout Submittals														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		23 09 00	Enclosure Keys	2.5	G												
			Password Summary Report	3.1.6.1	G												
			Closeout Quality Control (QC) Checklist	1.9.3	G												
		23 11 25	SD-02 Shop Drawings														
			Gas Piping System	1.5.3	G												
			Gas Piping System	2.2	G												
			Gas Piping System	3.3	G												
			SD-03 Product Data														
			Pipe and Fittings	1.6.1	G												
			Gas Equipment Connectors	1.5.3	G												
			Gas Piping System	1.5.3	G												
			Gas Piping System	2.2	G												
			Gas Piping System	3.3	G												
			Pipe Coating Materials	2.1	G												
			Pressure Regulators	2.6	G												
			Risers	2.4	G												
			Transition Fittings	2.2.12	G												
			Valves	2.3	G												
			Warning and Identification Tape	2.2.8	G												
			SD-06 Test Reports														
			Testing	3.19	G												
			Pressure Tests	3.19.1	G												
			Pressure Tests for Liquified Petroleum Gas	3.19.2	G												
			Test with Gas	3.19.3	G												

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 11 25	SD-07 Certificates															
			Welders Procedures and Qualifications	1.5.1	G													
			Assigned Number, Letter, or Symbol	1.5.1	G													
			SD-08 Manufacturer's Instructions															
			PE Pipe and Fittings	1.5.2	G													
			Pipe Coating Materials	2.1	G													
			SD-10 Operation and Maintenance Data															
			Gas Facility System and Equipment Operation	1.3.1	G													
			Gas Facility System Maintenance	1.3.2	G													
			Gas Facility Equipment Maintenance	1.3.3	G													
		23 21 23	SD-02 Shop Drawings															
			System Coordination	2.1.2	G													
			SD-03 Product Data															
			Instructions	2.2.2	G													
			Equipment Data	2.2.5	G													
			Training Period	3.5.2	G													
			SD-06 Test Reports															
			Factory Tests	2.1.1														
			Field Quality Control	3.3														
			SD-07 Certificates															
			Manufacturer's Representative	1.3.1														



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 21 23	SD-10 Operation and Maintenance Data															
			Operation and Maintenance Manuals	3.5.1	G													
			Training	3.5.2	G													
		23 23 00	SD-02 Shop Drawings															
			Refrigerant Piping System	2.3	G													
			SD-03 Product Data															
			Refrigerant Piping System	2.3														
			Spare Parts	1.5.2														
			Qualifications	1.3.1														
			Refrigerant Piping Tests	3.5														
			Verification of Dimensions	3.1														
			SD-06 Test Reports															
			Refrigerant Piping Tests	3.5														
			SD-07 Certificates															
			Service Organization	2.1														
			SD-10 Operation and Maintenance Data															
			Maintenance	1.5	G													
			Operation and Maintenance Manuals	3.4	G													
			Demonstrations	3.4	G													
		23 25 00	SD-03 Product Data															
			Water Analysis	2.5	G													
			Spare Parts	1.6														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 25 00	Field Instructions	3.4														
			Tests	3.5	G													
			Training Course	3.4	G													
		23 35 00	SD-02 Shop Drawings															
			Detail Drawings	1.4.1	G													
			Exhaust System Installation	3.4	G													
			SD-03 Product Data															
			Related Submittals	1.4.2														
			Ductwork Components	2.4	G													
			Materials and Equipment	2.1														
			Spare Parts	1.6														
			Field Instructions	3.6														
			Final Acceptance Tests	3.7														
			Onsite Training	3.6	G													
			Exhaust System Specialist	1.4.2	G													
			SD-06 Test Reports															
			Final Acceptance Tests	3.7														
			SD-07 Certificates															
			Inspection	3.3	G													
			SD-10 Operation and Maintenance Data															
			Exhaust System	1.2														
			Operation and Maintenance Manuals	3.6														
		23 52 00	SD-02 Shop Drawings															
			Detail Drawings	1.5	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 52 00	SD-03 Product Data															
			Materials and Equipment	2.2.1														
			Spare Parts	1.5														
			Heating System Tests	3.9														
			Fuel System Tests	3.12														
			Welding	1.3														
			Qualifications	3.9														
			Field Instructions	3.11														
			Tests	3.5														
			SD-06 Test Reports															
			Heating System Tests	3.9														
			Fuel System Tests	3.12														
			SD-07 Certificates															
			Bolts	2.9.9.3														
			Energy Star	2.2.3														
			SD-10 Operation and Maintenance Data															
			Operation and Maintenance Instructions	3.11	G													
			SD-11 Closeout Submittals															
			Energy Efficient Equipment for Boilers	2.1	S													
			Indoor Air Quality During Construction	3.1	S													
		23 54 16	SD-02 Shop Drawings															
			Detail Drawings	1.3	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 54 16	Installation	3.2	G													
			SD-03 Product Data															
			Spare Parts	1.5														
			SD-06 Test Reports															
			Testing, Adjusting, and Balancing	3.4														
			SD-10 Operation and Maintenance															
			Data															
			Operation and Maintenance	3.3														
			Instructions															
		23 64 10	SD-03 Product Data															
			Water Chiller	2.10.2	G													
			Posted Instructions	3.2.3														
			Verification of Dimensions	1.5.1														
			Factory Tests	2.9														
			System Performance Tests	3.7														
			Demonstrations	3.8														
			Water Chiller - Field Acceptance	3.6.1														
			Test Plan															
			SD-06 Test Reports															
			Field Acceptance Testing	3.6														
			Water Chiller - Field Acceptance	3.6.2														
			Test Report															
			Factory Tests	2.9														
			System Performance Tests	3.7														
			SD-07 Certificates															
			Refrigeration System	3.2.9	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 64 10	SD-08 Manufacturer's Instructions															
			Water Chiller - Installation Instructions	3.2	G													
			SD-10 Operation and Maintenance Data															
			Operation and Maintenance Manuals	3.8	G													
			SD-11 Closeout Submittals															
			Energy Efficient Equipment for Chillers	2.1.1	S													
			Indoor Air Quality During Construction	3.1.1	S													
			Ozone Depleting Substances	2.1.2	S													
		23 64 26	SD-03 Product Data															
			Grooved Mechanical Connections For Steel	2.2.2.4	G PO													
			Grooved Mechanical Connections For Copper	2.4.3	G PO													
			Calibrated Balancing Valves	2.5.8	G PO													
			Automatic Flow Control Valves	2.5.9	G PO													
			Pump Discharge Valve	2.5.10														
			Water Temperature Mixing Valve	2.5.11	G													
			Water Temperature Regulating Valves	2.5.12	G													
			Water Pressure Reducing Valve	2.5.13														
			Pressure Relief Valve	2.5.14														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		23 64 26	Combination Pressure and Temperature Relief Valves	2.5.15														
			Expansion Joints	2.6.9	G PO													
			Combination Strainer and Pump Suction Diffuser	2.6.3														
			Expansion Tanks	2.7														
			Air Separator Tanks	2.8														
			SD-06 Test Reports															
			Piping Welds NDE Report	3.1.1.3														
			Pressure Tests Reports	3.5.2	G PO													
			SD-07 Certificates															
			Employer's Record Documents (For Welding)	3.1.1.1														
			Welding Procedures and Qualifications	3.1.1.2														
			SD-08 Manufacturer's Instructions															
			Lesson plan for the Instruction Course	3.6	G PO													
			SD-10 Operation and Maintenance Data															
			Calibrated Balancing Valves	2.5.8	G PO													
			Automatic Flow Control Valves	2.5.9	G PO													
			Pump Discharge Valve	2.5.10	G PO													
			Water Temperature Mixing Valve	2.5.11	G PO													
			Water Temperature Regulating Valves	2.5.12	G PO													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(g)
		23 64 26	Water Pressure Reducing Valve	2.5.13	G PO													
			Pressure Relief Valve	2.5.14	G PO													
			Combination Pressure and Temperature Relief Valves	2.5.15	G PO													
			Expansion Joints	2.6.9	G PO													
			Combination Strainer and Pump Suction Diffuser	2.6.3	G PO													
			Expansion Tanks	2.7	G PO													
			Air Separator Tanks	2.8	G PO													
		23 82 02	SD-02 Shop Drawings															
			Drawings	1.4														
			SD-03 Product Data															
			Materials and Equipment	2.1														
			Spare Parts	1.6														
			Posted Instructions	3.4														
			Verification of Dimensions	3.1														
			Coil Corrosion Protection	2.8.1.1														
			System Performance Tests	3.6														
			Demonstrations	3.4	G													
			SD-06 Test Reports															
			Refrigerant Tests, Charging, and Start-Up	3.5	G													
			System Performance Tests	3.6	G													
			SD-07 Certificates															
			Materials and Equipment	2.1														
			Service Organization	2.1.1														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		23 82 02	SD-10 Operation and Maintenance Data														
			Operation and Maintenance Manuals	3.4	G												
		25 05 11	SD-01 Preconstruction Submittals														
			Wireless Communication Request	3.1.5.3	G												
			Device Account Lock Exception Request	3.1.2.2	G												
			Multiple IP Connection Device Request	3.9	G												
			Contractor Computer Cybersecurity Compliance Statements	1.10.1.4	G												
			Contractor Temporary Network Cybersecurity Compliance Statements	1.10.6	G												
			Control System Cybersecurity Subject Matter Expert	1.7.1	G												
			SD-02 Shop Drawings														
			User Interface Banner Schedule	3.1.3.1													
			Network Communication Report	1.8.2	G												
			Cybersecurity Riser Diagram	1.8.5	G												
			Control System Inventory Report	1.8.3	G												
			Cybersecurity Interconnection Schedule	1.8.1	G												



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		25 05 11	SD-03 Product Data															
			Control System Cybersecurity Documentation	1.8.6	G													
			SD-06 Test Reports															
			Wireless Communication Test Report	3.1.5.4	G													
			SD-07 Certificates															
			Software Licenses	1.9	G													
			SD-11 Closeout Submittals															
			Password Summary Report	3.5.2.2.5														
			Software Recovery And Reconstitution Images	1.8.4														
			Device Audit Record Upload Software	3.2.2.1														
		25 08 10	SD-06 Test Reports															
			Building Level DDC Testing Sequence	3.1														
			Performance Verification Test	3.5	G													
		26 05 48	SD-02 Shop Drawings															
			Lighting Fixtures in Buildings	3.1														
			Equipment Requirements	1.3														
			SD-03 Product Data															
			Lighting Fixtures in Buildings	3.1														
			Equipment Requirements	1.3														
			Contractor Designed Bracing	1.2.4														
		26 08 00	SD-06 Test Reports															

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		26 08 00	Acceptance tests and inspections	3.1	G													
			SD-07 Certificates															
			Qualifications	1.4.1	G													
			Acceptance test and inspections procedure	1.4.3	G													
		26 20 00	SD-02 Shop Drawings															
			Panelboards	2.15	G													
			Transformers	2.19	G													
			Busway	2.4	G													
			Cable trays	2.5	G													
			Wireways	2.31														
			Marking strips	3.1.12.1														
			SD-03 Product Data															
			Receptacles	2.14														
			Circuit breakers	2.15.3														
			Switches	2.12														
			Transformers	2.19	G													
			Enclosed circuit breakers	2.17														
			Motor controllers	2.21														
			Manual motor starters	2.22														
			Metering	2.32														
			Electric Vehicle Supply Equipment	2.16														
			Electric Vehicle Supply Equipment	3.1.19														
			Grounding Busbar	2.25.3														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(g)
		26 20 00	Surge protective devices	2.33														
			SD-06 Test Reports															
			600-volt wiring test	3.5.2														
			Grounding system test	3.5.5														
			Transformer tests	3.5.3														
			Ground-fault receptacle test	3.5.4														
			SD-07 Certificates															
			Fuses	2.13														
			SD-09 Manufacturer's Field Reports															
			Transformer factory tests	2.35.1														
			SD-10 Operation and Maintenance Data															
			Electrical Systems	1.5.1														
			Metering	2.32														
			Electric Vehicle Supply Equipment	2.16														
			Electric Vehicle Supply Equipment	3.1.19														
		26 27 13.10	SD-03 Product Data															
			Power Meters	2.1	G													
			Current Transformers	3.3.1.2														
			Potential Transformer	2.1.2														
			Communications Module	2.2.2														
			Protocol Modules	1.6.1														
			Data Recorder	1.6.2														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		26 27 13.10	Modem	1.6.2														
			SD-06 Test Reports															
			Acceptance Checks and Tests	3.3.1														
			SD-10 Operation and Maintenance Data															
			Power Meters	2.1														
			Communications Module	2.2.2														
			Protocol Modules	1.6.1														
			Data Recorder	1.6.2														
			Modem	1.6.2														
			SD-11 Closeout Submittals															
			System Function Verification	3.3.2														
		26 28 01	SD-03 Product Data															
			Fault Current Analysis	2.9														
			Protective Device Coordination Study	2.9														
			Equipment	2.1														
			System Coordinator	1.4.1														
			Protective Relays	3.3.4														
			Installation	3.2														
			SD-06 Test Reports															
			Field Testing	3.3														
			SD-07 Certificates															
			Devices and Equipment	1.6														
		26 29 23	SD-02 Shop Drawings															
			Schematic diagrams	1.5.1														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		26 29 23	Interconnecting diagrams	1.5.2														
			Installation drawings	1.5.3														
			SD-03 Product Data															
			Variable frequency drives	2.1	G													
			Wires and cables	2.3														
			Equipment schedule	1.5.4														
			SD-06 Test Reports															
			VFD Test	3.2.1														
			Performance Verification Tests	3.2.2														
			Endurance Test	3.2.3														
			SD-08 Manufacturer's Instructions															
			Installation instructions	1.5.5														
			SD-09 Manufacturer's Field Reports															
			VFD Factory Test Plan	2.5.1														
			Factory test results	1.5.6														
			SD-10 Operation and Maintenance Data															
			Variable frequency drives	2.1														
		26 31 00	SD-02 Shop Drawings															
			Schematic Diagrams	2.9	G													
			Interconnection Diagrams	2.9	G													
			Installation Drawings	3.1	G													
			SD-03 Product Data															
			Combiner Boxes	2.4														
			Disconnects	3.1.3	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		26 31 00	Inverters	2.3	G													
			String Inverter CEC Efficiency	2.3.1	G													
			Ground Mounting Structure for Modules	2.5	G													
			Photovoltaic Module Backsheet	2.2.1														
			Photovoltaic Module Encapsulent	2.2.2														
			Photovoltaic Modules	2.2	G													
			Photovoltaic Wire	2.2	G													
			System Monitoring	2.7	G													
			SD-05 Design Data															
			System Operation Calculations	1.6.3	G													
			System Performance Calculations	1.9	G													
			System Performance Calculations	1.6.10	G													
			SD-06 Test Reports															
			NABCEP Acceptance Checks and Tests	3.9.1	G													
			NETA Acceptance Checks and Tests	3.9.2	G													
			SD-07 Certificates															
			Installer	1.6.4	G													
			Materials	1.6.5	G													
			Warranty	1.8	G													
			Cybersecurity Equipment Certification	1.6.6	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		26 31 00	Cybersecurity Installation Certification	3.9.4	G												
			SD-08 Manufacturer's Instructions Installation Instructions	3.1	G												
			SD-10 Operation and Maintenance Data														
			Electrical Systems	1.6.7.1	G												
			Training Course	1.6.7.2	G												
		26 41 00	SD-02 Shop Drawings														
			Overall lightning protection system	1.4.1.1	G												
			Each major component	1.4.1.2	G												
			SD-06 Test Reports														
			Lightning Protection and Grounding System Test Plan	1.4.3													
			Lightning Protection and Grounding System Test	3.5.1	G												
			SD-07 Certificates														
			Lightning Protection System Installers Documentation	1.2.3	G												
			Component UL Listed and Labeled	1.4.2													
			Lightning protection system inspection certificate	1.4.4	G												
			Roof manufacturer's warranty	3.1.1													
		26 42 14	SD-02 Shop Drawings														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		26 42 14	Drawings	1.3.6													
			Contractor's Modifications	2.1.1	G												
			SD-03 Product Data														
			Equipment	2.1													
			Spare Parts	1.5													
			SD-06 Test Reports														
			Tests and Measurements	3.5													
			Contractor's Modifications	2.1.1													
			SD-07 Certificates														
			Cathodic Protection System	2.1													
			Services of 'Corrosion Expert'	1.3.1													
			SD-10 Operation and Maintenance														
			Data														
			Cathodic Protection System	2.1													
			Training Course	3.6													
		26 51 00	SD-02 Shop Drawings														
			Luminaire Drawings	1.5.1	G												
			Occupancy/Vacancy Sensor	1.5.2	G												
			Coverage Layout														
			SD-03 Product Data														
			Luminaires	2.2	G												
			Light Sources	2.4	G												
			Drivers, Ballasts and Generators	2.3													
			LED Luminaire Warranty	1.6.1													
			Luminaire Design Data	1.5.4													
			Vacancy Sensors	2.5.3.2													



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(g)
		26 51 00	Dimming Controllers (Dimmers)	2.5.2														
			Lighting Contactor	2.5.4														
			Timeswitch	2.5.5														
			Power Hook Luminaire Hangers	2.8														
			Exit Signs	2.6.1														
			LED Emergency Drivers	2.6.2														
			Occupancy Sensors	2.5.3.1														
			Ambient Light Level Sensor	3.1.8														
			Lighting Control Panel	2.5.6	G													
			SD-06 Test Reports															
			LED Luminaire - IES LM-79 Test Report	1.5.5														
			LED Light Source - IES LM-80 Test Report	1.5.6														
			LED Light Source - IES TM-21 Test Report	1.5.7														
			Occupancy/Vacancy Sensor Verification Tests	1.5.8	G													
			Energy Efficiency	1.5.11.3														
			SD-07 Certificates															
			Luminaire Useful Life Certificate	1.6.1.1	G													
			LED Driver and Dimming Switch Compatibility Certificate	1.5.3	G													
		26 56 00	SD-01 Preconstruction Submittals															
			Photometric Plan	1.5.3	G													
			LED Luminaire Warranty	1.7.1	G													

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		26 56 00	SD-02 Shop Drawings														
			Luminaire drawings	1.5.2.1	G												
			Poles	1.5.2.2	G												
			SD-03 Product Data														
			LED Luminaires	2.2	G												
			Luminaire Light Sources	2.2.2	G												
			Luminaire Power Supply Units (Drivers)	2.2.3	G												
			Lighting contactor	2.3.3													
			Time switch	2.3.2													
			Lighting Control Relay Panel	2.3.4	G												
			Motion Sensor	2.3.5													
			Photocell	2.3.1													
			Aluminum poles	2.4.1	G												
			SD-05 Design Data														
			Design Data for luminaires	1.5.4	G												
			SD-06 Test Reports														
			LED Luminaire - IES LM-79 Test Report	1.5.5													
			LED Light Source - IES LM-80 Test Report	1.5.6													
			Operating test	3.2													
			SD-07 Certificates														
			Luminaire Useful Life Certificate	1.7.1													
			SD-10 Operation and Maintenance Data														

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																		(g)
		26 56 00	Operational Service	1.8														
		27 05 14.00 10	SD-02 Shop Drawings															
			Cable TV Premises Distribution System	1.2														
			Installation	3.1														
			SD-03 Product Data															
			Spare Parts	1.7														
			Test Plan	3.4														
			Qualifications	1.4														
			SD-06 Test Reports															
			Testing	3.4														
			SD-07 Certificates															
			Materials and Equipment	2.1														
			SD-08 Manufacturer's Instructions															
			Manufacturer's Recommendations	3.1.1														
			SD-10 Operation and Maintenance Data															
			Operation and Maintenance Manuals	3.5														
		27 05 28.36	SD-02 Shop Drawings															
			Fabrication Drawings	2.2	G													
			Installation Drawings	3.1.2	G													
			SD-03 Product Data															
			Cable Trays	2.1	G													
			Supports	2.3.1														

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		27 05 28.36	SD-08 Manufacturer's Instructions														
			Manufacturer's Instructions	3.1.1													
		27 10 00	SD-02 Shop Drawings														
			Telecommunications drawings	1.5.1.1	G												
			Telecommunications Space Drawings	1.5.1.2	G												
			SD-03 Product Data														
			Telecommunications cabling	2.3													
			Patch panels	2.4.3	G												
			Telecommunications outlet/connector assemblies	2.5													
			Equipment support frame	2.4.2													
			Connector blocks	3.1.6.1													
			Spare Parts	1.9.3	G												
			SD-06 Test Reports														
			Telecommunications cabling testing	3.5.1													
			SD-07 Certificates														
			Telecommunications Contractor	1.5.2.1													
			Key Personnel	1.5.2.2	G												
			Manufacturer Qualifications	1.5.2.3													
			Test plan	1.5.3													
			SD-09 Manufacturer's Field Reports														
			Factory reel tests	2.11.1	G												

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																		(g)
		27 10 00	SD-10 Operation and Maintenance Data															
			Telecommunications cabling and pathway system	1.9.1														
			SD-11 Closeout Submittals															
			Record Documentation	1.9.2														
		27 13 23	SD-01 Preconstruction Submittals															
			Qualifications	1.3.1	G													
			Quality Assurance Plan	1.3.1	G													
			SD-02 Shop Drawings															
			Fiber Optic System Contract Drawings	1.3.1														
			Detailed Shop Drawings	1.3.1														
			Record (As-Built) Drawings	3.3														
			SD-03 Product Data															
			Optical Fibers	1.3.1														
			Fiber Optic Cable Design	1.3.1														
			Splice Organizers	1.3.1														
			Pre-Connected Cable Assembly	1.3.1														
			Fiber Optic Terminal Cabinets	1.3.1														
			Fiber Optic Terminal Cabinets	2.2.5														
			Optical Patch Panel Assemblies	1.3.1														
			Fiber Optic Media Types	1.3.1														
			Fiber Optic Terminations and Connectors	1.3.1														
			Fiber Optic Enclosures	1.3.1														

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		27 13 23	SD-06 Test Reports														
			Factory Test Certificates	2.4.2													
			Single and Multi-Mode OTDR Test	3.2.1.1													
			End-to-End Attenuation Tests	3.2.1.2													
			End-to-End Bandwidth Tests	3.2.1.3													
			Fiber Optic Factory Test Plan	1.5.4													
			Fiber Optic Field Tests Plan	1.5.5													
			SD-07 Certificates														
			Fiber Optic Cable Installer and Splicer Qualifications	1.3.1													
			Manufacturer's Qualifications	1.3.1													
			SD-08 Manufacturer's Instructions														
			Fiber Optic System Instructions	1.3.1													
		27 51 16	SD-02 Shop Drawings														
			Detail Drawings	2.1.4	G												
			SD-03 Product Data														
			Spare Parts	1.4													
			SD-06 Test Reports														
			Approved Test Procedures	3.5													
			Acceptance Tests	3.5													
			SD-07 Certificates														
			Components	2.2													
			SD-10 Operation and Maintenance Data														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		27 51 16	Radio and Public Address System	2.1	G												
		28 08 10	SD-05 Design Data														
			Test Plan	3.1	G												
			SD-06 Test Reports														
			Draft Test Report	3.2.2													
			Final Test Report	3.4	G												
			SD-07 Certificates														
			Qualifications	1.4.1													
		28 10 05	SD-02 Shop Drawings														
			ESS Components	1.3.3.1	G												
			Overall System Schematic	1.3.3.2	G												
			SD-03 Product Data														
			Access Control Unit	2.4.4	G												
			Access Control Devices	2.4.5	G												
			Cameras	2.5.1	G												
			Camera Lenses	2.5.1.2													
			Camera Housing and Mounts	2.5.1.4													
			Video Recording	2.5.4.3													
			Communications Interface	2.7													
			Devices														
			Network Switch	2.7.3													
			Video and ESS Transmission	2.7.4													
			Uninterruptible Power Supply (UPS)	2.9.1	G												
			Component Enclosure	2.11													

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		28 10 05	Equipment Rack	2.12													
			SD-05 Design Data														
			Backup Battery Capacity Calculations	1.5.1	G												
			Throughput Rates	2.4.2													
			CCTV Storage Calculations	1.5.2													
			SD-07 Certificates														
			Contractor Qualifications	1.3.4.1													
			Instructor Qualifications	1.3.4.2													
			SD-10 Operation and Maintenance Data														
			Training Plan	3.6.1													
			Training Content	3.6													
			ESS Components	1.3.3.1													
			ESS Software	1.6													
			SD-11 Closeout Submittals														
			As-Built Drawings	1.7	G												
		28 31 49	SD-03 Product Data														
			Carbon monoxide detector	2.1													
			SD-06 Test Reports														
			Carbon monoxide detector test	3.2.1													
			SD-10 Operation and Maintenance Data														
			Carbon monoxide detector	2.1													
		28 31 76	SD-02 Shop Drawings														
			Nameplates	2.1.2													



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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		28 31 76	Instructions	2.14.9														
			Wiring Diagrams	3.3.1	G													
			System Layout	1.2.1	G													
			System Operation	2.3	G													
			Notification Appliances	2.18	G													
			Amplifiers	2.15														
			SD-03 Product Data															
			Technical Data And Computer Software	1.6														
			Fire Alarm Control Unit and Mass Notification Control Unit (FMCP)	2.13														
			Terminal Cabinets	3.3.2														
			Manual Stations	2.17														
			Transmitters	2.20														
			Batteries	2.12.1														
			Battery Chargers	2.12.2														
			Smoke Sensors	2.10														
			Notification Appliances	2.18	G													
			Addressable Interface Devices	2.7	G													
			Amplifiers	2.15														
			Tone Generators	2.15														
			Digitalized Voice Generators	2.15														
			Remote Fire Alarm/Mass Notification Control Units	2.14	G													
			Radio Transmitter and Interface Panels	2.20.1	G													

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		28 31 76	Digital Alarm Communicator Transmitter (DACT)	2.20.2	G													
			Local Operating Console (LOC)	1.4.4	G													
			SD-05 Design Data															
			Battery Power	2.12.1.2	G													
			Battery Chargers	2.12.2	G													
			Voltage Drop Calculations	2.3.1														
			SD-06 Test Reports															
			Field Quality Control	3.6														
			Testing Procedures	3.6.1	G													
			Smoke Sensor Testing	2.10.3	G													
			SD-07 Certificates															
			Installer	1.7.1.4														
			Formal Inspection and Tests	3.6.2.2														
			Final Testing	3.6.2.3														
			Designer Qualifications	1.7.1.1	G													
			SD-09 Manufacturer's Field Reports															
			System Operation	2.3														
			Fire Alarm/Mass Notification System	1.7.2.2														
			SD-10 Operation and Maintenance Data															
			Operation and Maintenance (O&M) Instructions	3.9														

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		28 31 76	Instruction of Government Employees	3.7														
			SD-11 Closeout Submittals															
			As-Built Drawings	3.6.2.4														
		31 00 00	SD-01 Preconstruction Submittals															
			Shoring	3.2	G													
			Dewatering Work Plan	1.3.3	G													
			SD-03 Product Data															
			Utilization of Excavated Materials	3.6	G													
			Shoulder Construction	3.12														
			SD-06 Test Reports															
			Testing	3.14														
			Borrow Site Testing	2.1														
			SD-07 Certificates															
			Testing	3.14														
		31 11 00	SD-03 Product Data															
			Tree Wound Paint	2.1.1														
		32 11 20	SD-03 Product Data															
			Plant, Equipment, and Tools	1.4	G													
			SD-06 Test Reports															
			Initial Tests	2.2.1	G													
			In-Place Tests	3.12.1	G													
		32 11 23	SD-03 Product Data															
			Plant, Equipment, and Tools	1.4	G													
			SD-06 Test Reports															
			Initial Tests	2.3.1	G													

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		32 11 23	In-Place Tests	3.12.1	G												
		32 12 10	SD-06 Test Reports Sampling and Testing	3.7													
		32 12 17	SD-04 Samples Bituminous pavement	1.6.1.6													
			SD-05 Design Data Job-mix formula	1.3.2													
			Asphalt Cement Binder	2.2													
			Mix Design	2.3													
			SD-06 Test Reports Specific gravity test of asphalt	2.4.1													
			Coarse aggregate tests	2.4.1													
			Percent of crushed pieces in gravel	2.4.1													
			Fine aggregate tests	2.4.1													
			Specific gravity of mineral filler	2.4.1													
			Bituminous mixture tests	2.4.1													
			Aggregates tests	3.5.2.1													
			Bituminous mix tests	3.5.2.2													
			Pavement courses	3.5.2.3													
		32 12 18	SD-04 Samples Open Graded Asphalt Job Mix	2.7.1													
			Formula														
			Job Mix Formula for Slurry Grout	2.7.2													
			SD-06 Test Reports Coarse Aggregate	2.2.1	G												

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		32 12 18	Coarse and Fine Aggregates	2.2	G												
			Open-Graded Mix Aggregate	2.2.3	G ERDC												
			Bituminous Material	2.3	G												
			Slurry Grout Sand	2.2.4	G ERDC												
			Filler (Fly Ash)	2.2.5	G ERDC												
			Job Mix Formula for Slurry Grout	2.7.2	G ERDC												
			Contractor Quality Control	3.13	G												
			SD-07 Certificates														
			Cement	2.4	G												
			Cross Polymer Resin	2.5	G												
			Curing Compound	2.6	G												
		32 16 13	SD-03 Product Data														
			Concrete	2.1													
			Biodegradable Form Release Agent	2.6.3													
			Biodegradable Form Release Agent	3.2													
			SD-06 Test Reports														
			Field Quality Control	3.8													
		32 17 23	SD-03 Product Data														
			Surface Preparation Equipment List	2.1.1	G												
			Application Equipment List	2.1.2	G												
			Exterior Surface Preparation	3.2													
			Safety Data Sheets	1.3.1	G												
			Reflective media for roads	2.2.7.1	G												

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		32 17 23	Waterborne Paint	2.2.1	G												
			Solventborne Paint	2.2.2	G												
			SD-06 Test Reports														
			Reflective Media for Roads	2.2.7.1	G												
			Waterborne Paint	2.2.1	G												
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			High Build Acrylic Coating (HBAC)	2.2.6	G												
			Thermoplastic Compound	2.2.5	G												
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			Reflective Media for Roads	2.2.7.1													
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			Volatile Organic Compound	1.3.1	G												
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			SD-08 Manufacturer's Instructions														
			Waterborne Paint	2.2.1	G												
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		32 31 13.53	SD-02 Shop Drawings														
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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		32 31 13.53	Gate Assembly	1.3.2													
			Gate Assembly	2.6.1													
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		32 31 13.53	Gate Hardware and Accessories	1.3.2														
			Gate Hardware and Accessories	2.6.3														
			Turnstiles	1.3.2														
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			aluminum alloy coating	1.3.1														
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		32 31 13.53	Gate Assembly	2.6.1														
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			Commissioning Plan	1.4	G													
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			Control Valve Checklist	3.5.1	G													
			Commissioning Report	1.6	G													
			SD-07 Certificates															
			Certification of Completion	1.5														
			Disposal of Waste Materials	1.7														
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			Pipe, Fittings, Joints and Couplings	2.2	G													
			Valves	2.3	G													
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			Valve Boxes	2.3.4	G													
			Hydrants	2.4.1	G													

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																		(g)
		33 11 00	Pipe Anchorage	2.2.4	G													
			Tapping Sleeves	2.5.1	G													
			Fire Department Connections	2.5.7	G													
			SD-06 Test Reports															
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		33 30 00	Pipeline Materials	2.1														
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			SD-07 Certificates															
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			Gaskets	2.1.3.2														
		33 40 00	SD-04 Samples															
			Pipe for Culverts and Storm Drains	2.1														
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			Leakage Test	3.9.3.1														
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			SD-08 Manufacturer's Instructions															
			Placing Pipe	3.3														
		33 51 13	SD-03 Product Data															
			Pressure Regulator	2.3.3	G													
			Valves	2.3														
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		33 51 13	SD-07 Certificates															
			Welder's Qualifications	1.3.1														
			Welder's Identification Symbols	1.3.1														
		33 51 15	SD-02 Shop Drawings															
			Pipe, Fittings, and Associated Materials	2.1														
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			Materials and Equipment	2.1	G													
			Spare Parts	1.6	G													
			Pipe and Accessory Coatings	2.1	G													
			SD-05 Design Data															
			Connections to Existing Lines	3.12	G													
			Connection and Abandonment Plan	1.4.2.2	G													
			SD-06 Test Reports															
			Pressure and Leak Tests	3.13.2														
			SD-07 Certificates															
			Welder's training, qualifications and procedures	1.4.1.1														
			Jointing of Polyethylene Piping	1.4.1.2														
			Utility Work	3.12.1														
			SD-10 Operation and Maintenance Data															
			Gas Distribution System and Equipment Operation	3.14.1	G													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
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		33 56 10	SD-02 Shop Drawings														
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			SD-03 Product Data														
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			Tank Protective Coatings	2.5													
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			Contractor Qualifications	1.4.1	G												
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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE	DATE OF ACTION
		33 56 10	Automatic Level Alarm System	2.7														
			Tank Gauges	2.8														
			SD-10 Operation and Maintenance Data															
			Aboveground Storage Tank	2.4	G													
			Automatic Level Alarm System	2.7	G													
			Tank Gauges	2.8	G													
		33 58 00	SD-02 Shop Drawings															
			Leak Detection System	2.3	G													
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		33 71 02	SD-02 Shop Drawings														
			Aluminum conductors	2.2.1	G												
			Precast underground structures	1.5.1	G												
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		33 82 00	SD-02 Shop Drawings														
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																		(g)
		33 82 00	Wire and cable	2.8														
			Cable splices, and connectors	2.5														
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			Building protector assemblies	2.2.1	G													
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		33 82 00	Telecommunications outside plant (OSP)	1.6.1.1														
			SD-11 Closeout Submittals															
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			Overhead Electric Traveling (OET) Crane(s)	1.5.1	G													
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			Pendant Control Station	2.4.6	G													
			Overloads	2.4.8.5	G													
			Limit Switches	2.4.9	G													



PART 3 EXECUTION

3.1 AVAILABILITY AND USE OF UTILITY SERVICES

3.1.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.1.2 Payment for Utility Services

- a. The Government will make all reasonably required utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed will be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. Carefully conserve any utilities furnished without charge.
- b. Reasonable amounts of the following utilities will be made available to the Contractor at the following rates:

Utility Services		
	Cost (\$) per	Unit
Electricity	\$0.112	KWH
Potable Water/Waste Water	\$1.87/6.52	1,000 Gallons
Natural Gas	\$0.53	Therm

- c. The point at which the Government will deliver such utilities or services and the quantity available is as indicated. Pay all costs incurred in connecting, converting, and transferring the utilities to the work. Make connections, including providing backflow-preventing devices on connections to domestic water lines; and providing transformers; and make disconnections.

3.1.3 Meters and Temporary Connections

At the Contractors expense and in a manner satisfactory to the Contracting Officer, provide and maintain necessary temporary connections, distribution lines, and meter bases (Government will provide meters) required to measure the amount of each utility used for the purpose of determining charges. Notify the Contracting Officer, in writing, 5 working days before final electrical connection is desired so that a utilities contract can be established. The Government will provide a meter and make the final hot connection after inspection and approval of the Contractor's temporary wiring installation. The Contractor will not make the final electrical connection.

3.1.4 Advance Deposit

An advance deposit for utilities consisting of an estimated month's usage or a minimum of \$50.00 will be required. The last monthly bills for the fiscal year will normally be offset by the deposit and adjustments will be

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- 1.2 SUSTAINABILITY REPORTING
  - 1.2.1 EPA Comprehensive Procurement Guidelines
  - 1.2.2 USDA Biobased
- 1.3 SUBMITTALS
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PART 2 PRODUCTS

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## SECTION 12 48 13

## ENTRANCE FLOOR MATS AND FRAMES

## PART 1 GENERAL

## 1.1 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 B221	(2014) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B221M	(2013) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM D2047	(2011) Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
ASTM E648	(2017) Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

## U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

36 CFR 1191	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines
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## 1.2 SUSTAINABILITY REPORTING

Materials in this technical specification may increase contract compliance with sustainability requirements.

## 1.2.1 EPA Comprehensive Procurement Guidelines

See Section 01 33 29 SUSTAINABILITY REPORTING for requirements associated with EPA-designated products.

## 1.2.2 USDA Biobased

See Section 01 33 29 SUSTAINABILITY REPORTING for requirements associated with USDA Biobased products.

## 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control

approval. Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Installation Drawings; G

Detail Drawings; G

Custom Graphics Drawings; G

SD-03 Product Data

Entrance Floor Mats and Frames; G

Adhesives and Concrete Primers; G

SD-04 Samples

Entrance Floor Mats and Frames; G

Custom Graphics; G

SD-08 Manufacturer's Instructions

Manufacturer's Instructions

SD-10 Operation and Maintenance Data

Protection, Maintenance, and Repair Information

1.4 QUALITY CONTROL

Comply with 36 CFR 1191 Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines for installed entrance floor mats and frames. Ensure that entrance floor mats and frames are slip-resistant in accordance with ASTM D2047, with a minimum 0.60 coefficient of friction, for accessible routes and are structurally capable of withstanding a wheel load of 350 lb/wheel. Ensure that flammability is in accordance with ASTM E648, Class 1, Critical Radiant Flux, minimum 0.45 watts/square meter.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the project site in their original packages or containers bearing labels clearly identifying the manufacturer, brand name, and quality or grade.

Store materials in their original unbroken packages or containers in the area in which they will be installed. Unwrap, inspect, and place mats at indicated locations. Remove all excess packing materials.

## PART 2 PRODUCTS

### 2.1 MANUFACTURED UNITS

#### 2.1.1 Entrance Floor Mats and Frames

Submit the manufacturer's catalog data. Submit samples of assembled sections of floor mats showing corners, intersections, and other details of construction. Submit samples of custom graphics, exposed floor mats, frame finishes and accessories.

##### 2.1.1.1 Frames

Provide recessed frames in extruded aluminum Alloy 6061-T6 or Alloy ~~6063~~ **6105**-T5 ASTM B221. Ensure that the frame depth accommodates the mat and system specified. Frame color is mill finish. Ensure that edge-frame members are fabricated in single lengths or with the fewest pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins. Ensure that any concealed surfaces of aluminum frames that contact cementous material are coated with the manufacturer's standard protective coating. Ensure that frames include accessories and devices required for a complete installation.

##### 2.1.1.2 Tread Insert Options

Provide tread inserts consisting of carpet composed of solution-dyed nylon or polypropylene carpet fibers fusion-bonded to a rigid two-ply backing to prevent fraying and supplied in continuous splice-free lengths; carpet has antistatic and antistain treatments. Ensure that pile weight is a minimum ~~30~~ **33** ounces per square yard.

#### 2.1.2 Adhesives and Concrete Primers

Provide adhesives and concrete primers, where required, according to the manufacturer's recommendations.

#### 2.1.3 Color and Size

Ensure that color is in accordance with the drawing I-610.

## PART 3 EXECUTION

### 3.1 EXAMINATION

Comply with the manufacturer's requirements for substrates and floor conditions affecting installation of floor mats and frames. Ensure that all unsatisfactory conditions have been corrected before installation.

### 3.2 INSTALLATION

Submit detail drawings, and custom graphics drawings as required. Provide installation drawings. Provide the manufacturer's protection, maintenance, and repair information.

Install floor mats and frames according to manufacturer's instructions. Set mat tops at the height recommended by the manufacturer for the most effective cleaning action. Provide clearance between bottoms of doors and tops of mats. Coordinate recess frame installation with concrete construction to ensure that frame anchorage is correct and that the base

is level and flat. Install grout and fill around frames and, if required to set mat tops at proper elevations, in recesses under mats. Finish grout and fill smooth and level.

-- End of Section --



secondary members. All analysis and results necessary to determine the structural adequacy of the bridge shall be reported. The following analyses are required:

#### 1.4.4.1 Stress and Deflection

Analysis shall be completed to determine that all bridge members, critical connections, and bridge configurations are sufficient to adequately resist the following load combinations and in accordance with section 4.2 of this specification:

- " Load Combination I - Dead Load Only
- " Load Combination II - Dead Load + Pedestrian Live Load
- " Load Combination III - Dead Load + Wind Loads
- " Load Combination IV - Dead Load + Vehicle loads
- " Load Combination V - Top Chord/Rail Load

#### 1.4.4.2 Frame Stability

Buckling analysis shall be completed to determine that the bridge frame is adequately stable and sufficient to resist forces causing it to buckle for the following load combinations and in accordance with section 4.2 of this specification.

- " Load Combination II - Dead Load + Pedestrian Live Load
- " Load Combination III - Dead Load + Wind Loads
- " Load Combination IV - Dead Load + Vehicle loads

#### 1.4.4.3 Frequency

Frequency analysis shall be completed to determine that the bridge frame is sufficient to avoid resonance due to frequencies likely encountered under normal use for the following load combinations and in accordance with section 4.2 of this specification.

- " Load Combination I - Dead Load Only

## PART 2 PRODUCTS

### 2.1 STRUCTURAL MEMBERS

All primary structural members are to be 6061-T6 aluminum for its high strength and corrosion resistance. Secondary members are to be 6000 series aluminum for corrosion resistance.

### 2.2 DECK

Decking shall meet one of the following criteria.

#### 2.2.1 Aluminum

Aluminum decking shall be aluminum alloy 6061-T6 extruded in accordance with the requirements of applicable sections of Federal Specifications QQ-A-200. Extruded aluminum slats shall have a raised ribbed surface integral to the extrusion. Ribs shall be mechanically knurled transversely to the ribbing to provide a non skid surface. The legs of each decking slat shall be welded to the side members and to any longitudinal with a minimum of 1-1/4 inches of weld per leg. The decking slats shall be placed

transversely.

2.2.2 Pressure Treated Pine

N/A

2.2.3 Tropical Hardwood

N/A

2.2.4 Composite Wood

N/A

2.3 BEARING PADS

All bearing pads shall be 1" thick UHMW adequately dimensioned to provide support to the structure over the full travel resulting from expansion and contraction.

2.4 FASTENERS

All fasteners required for assembly shall be stainless steel type 304. Insulating washers shall be provided where stainless steel and aluminum contact is anticipated to minimize the potential for galvanic action.

PART 3 EXECUTION

3.1 FABRICATION & ASSEMBLY

3.1.1 Welding

All aluminum members shall be welded using 5356 aluminum filler wire in accordance with AWS D1.2.

3.1.2 Expansion Slots

Slots shall be cut into bridge bearing area to allow for proper expansion and contraction of the bridge.