



PROJECT MANUAL FOR:

NEW KINDERGARTEN PROJECT

AVENAL, CALIFORNIA

11/04/20

AVENAL ELEMENTARY
REEF SUNSET UNIFIED SCHOOL DISTRICT
PROJECT NO: 394-0010

SET NO: _____

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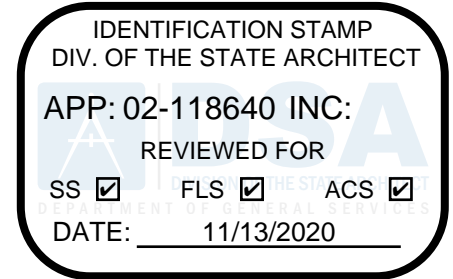
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**NEW KINDERGARTEN PROJECT
AVENAL ELEMENTARY
REEF SUNSET UNIFIED SCHOOL
DISTRICT
AVENAL, CALIFORNIA
KINGS COUNTY**

**APPROVED:
KERN COMMUNITY COLLEGE DISTRICT**

BY: BOARD RESOLUTION



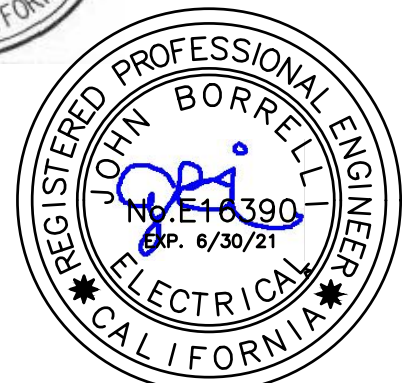
**J. PATRICK FOGARTY, AIA
AP Architects
3434 Truxtun Ave., Suite 240
Bakersfield, CA 93301
C – 19670**



**Alan Mok
Alan Mok Engineering
7415 N. Palm Ave., Suite 101
Fresno, CA 93711
#42618**



**John Borrelli
Borrelli & Associates, Inc.
2032 N. Gateway Blvd.
Fresno, CA 93727
#E16390**



**REEF SUNSET UNIFIED
SCHOOL DISTRICT**

**205 N. Park Ave,
Avenal, CA 93204**



AVENAL E.S KINDERGARTEN PROJECT

PROJECT MANUAL

BIDDING AND CONTRACT DOCUMENTS

PRE-BID JOB WALK:

Tuesday February 2, 2021 at 09:00 AM

BID OPENING:

Thursday, February 9, 2021 @ 11:30am
Reef Sunset Unified School District

BOARD APPROVAL:

Thursday, February 18, 2021

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SECTION 00010

NOTICE TO CONTRACTORS CALLING FOR BIDS

DISTRICT: REEF-SUNSET UNIFIED SCHOOL DISTRICT

PROJECT IDENTIFICATION: AVENAL ELEMENTARY SCHOOL
KINDERGARTEN CLASSROOM CONSTRUCTION

PROJECT NO: #21-01

BIDS DUE BY: Tuesday, February 9, 2021 @ 11:30am

ARCHITECT'S ESTIMATE: \$750,000

SUBMIT BIDS TO: Reef-Sunset Unified School District
Attn: Patrick Sanchez, Superintendent
205 North Park Avenue
Avenal, CA 93204
(559) 386-9083

BID AND CONTRACT DOCUMENTS AVAILABLE: <https://www.rsusd.net>

PRE-BID JOB WALK LOCATION: Avenal Elementary School
500 S. 1st Avenue, Avenal, CA 93204
NOTE: CHECK IN AT FRONT OFFICE

JOB WALK (NON-MANDATORY) DATE/TIME: Non-mandatory Job Walk by request only starting February 2, 2021; to arrange a Job Walk please contact the District's Program Manager, Mario Mera (Caldwell Flores Winters, Inc.) at **(310) 863-2980**

- ☐ **NOTICE IS HEREBY GIVEN** that Reef-Sunset Unified School District, acting by and through its Board of Trustees, hereinafter the "District" will receive up to, but not later than the above-stated date and time, sealed Bid Proposals for the Contract for the Work generally described as: **Bid #21.01, AVENAL ELEMENTARY SCHOOL KINDERGARTEN CLASSROOM CONSTRUCTION**. CONSTRUCTION SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING MAIN ITEMS OF WORK:

- ☐ The Contractor is responsible for all necessary materials, labor and equipment required to safely perform the following work:
Construction, delivery, and installation of one new Kindergarten modular building which will consist of three kindergarten classrooms and the associated

site work (i.e., Partial demolition, landscaping, hardscaping, etc.).

- 1.01 Prequalification Requirements.** Per California Assembly Bill (AB) 1565; ALL GENERAL CONTRACTORS AND MECHANICAL, ELECTRICAL AND PLUMBING SUBCONTRACTORS MUST BE PREQUALIFIED, if the project is valued at \$1 million or more and funded whole or in part with State Facility Bond funds.

To obtain a Prequalification Questionnaire please use the link below:

<https://www.dropbox.com/scl/fi/j142rfgfpupn4qwb0v3d/Attachment-A-Prequalification-Questionnaire.docx?dl=0&rlkey=tqr91ekiv75fj40wpo4gwx43m>

Please submit completed Prequalification Questionnaire to the District's Program Manager, Caldwell Flores Winters, Inc. at mmera@cfwinc.com or sburkett@cfwinc.com. If you have any questions regarding the prequalification process please contact the District's Program Manager, Caldwell Flores Winters, Inc. at mmera@cfwinc.com or sburkett@cfwinc.com.

- 1.01.1 Submittal of Bid Proposals.** All Bid Proposals shall be submitted on forms furnished by the District. Bid Proposals must conform with, and be responsive to, the Bid and Contract Documents, copies of which may be obtained from the District as set forth above. Only Bid Proposals submitted to the District prior to the date and time set forth above for the public opening and reading of Bid Proposals shall be considered.

- 1.01.2 Bid and Contract Documents.** To obtain Bid and Contract documents please visit the Reef Sunset Unified School District's website at <https://www.rsusd.net> or you may contact the District's Program Manager, Caldwell Flores Winters, Inc. at mmera@cfwinc.com or sburkett@cfwinc.com.

- 1.03 Bid Proposal.** Each Bid Proposal shall consist of:

- A. Bid Proposal
- B. Bid Security
- C. PWC-100 OSD Contractors Data Form-DIR Registration
- D. List of Subcontractors
- E. Non-Collusion Affidavit
- F. DVBE

All information or responses of a Bidder in its Bid Proposal and other documents accompanying the Bid Proposal shall be complete, accurate and true; incomplete, inaccurate or untrue responses or information provided therein by a Bidder may

be grounds for the District to reject such Bidder's Bid Proposal for non-responsiveness.

1.04 Job-Walk. The initial Pre-Bid Job Walk is to be held at the location, date and time stated above. Important information may be provided at the Pre-Bid Job Walk and although not mandatory it is recommended that bidders attend.

1.05 Prevailing Wage Rates; Employment of Apprentices and Labor Compliance Program. The Project is subject to the provisions of Labor Code §§1720 *et seq.* and regulations set forth in Title 8 §§16000 *et seq.* of the California Code of Regulations which govern the payment of prevailing wages on public works projects. All bidders shall be governed by and required to comply with these statutes and regulations in connection with the Project. Pursuant to Labor Code §1771, the Contractor receiving award of the Contract and Subcontractors of any tier shall pay not less than the prevailing wage rates to all workers employed in the execution of the Contract. Bidders shall comply with applicable statutes and regulations, including but not limited to Labor Code §§ 1771, 1775, 1777.5, 1813 and 1815.

Pursuant to Labor Code §1773, the Director of the Department of Industrial Relations has determined the generally prevailing rates of wages in the locality in which the Work is to be performed. Pursuant to Labor Code §1773.2, copies of these determinations, entitled "PREVAILING WAGE SCALE", are maintained at the District's offices located at 1900 Erin Drive, Needles, CA 92363 and are available to any interested party upon request. Copies of rate schedules are also available on the Internet at http://www.dir.ca.gov/DIR/S&R/statistics_research.html. The Contractor awarded the Contract for the Work shall post a copy of all applicable prevailing wage rates for the Work at conspicuous locations at the Site of the Work.

Bidders are directed to Article 4.21 of Section 00700 (General Conditions) and to Section 00900 (Labor Compliance Program Manual and Forms) for detailed requirements concerning payment of prevailing wage rates, payroll records, hours of work, employment of apprentices, and the District's LCP requirements and enforcement procedures.

No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

1.06 Contractors License Classification. In accordance with the provisions of California Public Contract Code §3300, the District requires that Bidders possess the following classification(s) of California Contractors License at the time that the Contract for the Work is awarded: **B (General Building)**

- 1.07 Contract Time.** Final completion of the work shall be achieved within **ONE HUNDRED EIGHTY (182) CALENDAR DAYS** beginning April 5, 2021 and ending October 4, 2021. ***Failure to achieve Final Completion within the Contract Time will result in the assessment of Liquidated Damages.***
- 1.08 Bid Security.** Each Bid Proposal shall be accompanied by Bid Security in an amount not less than **TEN PERCENT (10%)** of the maximum amount of the Bid Proposal, inclusive of any additive Alternate Bid Item(s). Failure of any Bid Proposal to be accompanied by Bid Security in the form and in the amount required shall render such Bid Proposal to be non-responsive and rejected by the District.
- 1.09 No Withdrawal of Bid Proposals.** No Bidder shall withdraw its Bid Proposal for a period of **sixty (60) days** after the award of the Contract by the District's Board of Trustees. During this time, all Bidders shall guarantee prices quoted in their respective Bid Proposals.
- 1.10 Substitute Security.** In accordance with the provisions of California Public Contract Code §22300, substitution of eligible and equivalent securities for any monies withheld by the District to ensure the Contractor's performance under the Contract will be permitted at the request and expense of the Contractor. The foregoing notwithstanding, the Bidder to whom the Contract is awarded shall have **thirty (30) days** following action by the District's Board of Trustees to award the Contract to such Bidder to submit its written request to the District to permit the substitution of securities for retention. The failure of the Bidder to make such written request to the District within said thirty (30) day period shall be deemed a waiver of the Bidder's rights under California Public Contract Code §22300.
- 1.11 Waiver of Irregularities.** The District reserves the right to reject any or all Bid Proposals or to waive any irregularities or informalities in any Bid Proposal or in the bidding.
- 1.12 Award of Contract.** The District proposes to award a separate Contract for Work If the Bid Proposal requires Bidders to propose prices for Alternate Bid Items, the District's selection of Alternate Bid Items, if any, for determination of the lowest priced Bid Proposal and for inclusion in the scope of the Contract to be awarded shall be in accordance with this Notice and the Instructions for Bidders.
- 1.13 Inquiries and Clarifications.** This document is for informational purposes and shall not relieve the Bidder of the requirements to fully familiarize himself with all the factors affecting the Project and his Bid. The District shall cease issuing any addenda no later than 72 hours before the time of the bid opening. The last RFI to be received by the District shall be **3:00pm, Friday, February 5, 2021**. Verbal communication by either party with regard to this matter is invalid. Inquiries shall be sent to: Mario Mera, Caldwell Flores Winters, Inc, mmera@cfwinc.com and will be forwarded to LDA for response. Subject line of email should read **"RFI for**

Avenal Elementary School Kindergarten Classroom Construction Project”.

- 1.14 Disabled Veteran Business Enterprise Participation Goals.** The District has established a participation goal of three percent (3%) for Disabled Veteran Business Enterprises (“DVBE”) of the Work of the Contract. The District’s forms of DVBE Participation Program Policy and Report are included in the Contract Documents.

END OF SECTION

SECTION 00100

INSTRUCTIONS FOR BIDDERS

1.01 Preparation and Submittal of Bid Proposal.

- A. Bid Proposal Preparation.** All information required by the bid forms must be completely and accurately provided. Numbers shall be stated in both words and figures where so indicated in the bid forms; conflicts between a number stated in words and in figures are governed by the words, except where the figures represent an express, correctly calculated sum. Partially completed Bid Proposals may be deemed non-responsive. Bid Proposals submitted on other than the bid forms included herein shall be deemed non-responsive. Bid Proposals not conforming to these Instructions for Bidders and the Notice to Contractors Calling for Bids (“Call for Bids”) may be deemed non-responsive and rejected. Each Bidder is solely responsible for all costs and expenses incurred by the Bidder in preparing and submitting a Bid Proposal to the District.
- B. Bid Proposal Submittal.** Bid Proposals shall be submitted at the place designated in the Call for Bids in sealed envelopes bearing on the outside the Bidder’s name and address along with an identification of the Work for which the Bid Proposal is submitted. Bidders are solely responsible for timely submission of Bid Proposals to the District at the place designated in the Call for Bids.
- C. Date and Time of Bid Proposal Submittal.** A Bid Proposal is considered submitted only if the outer envelope containing the Bid Proposal is stamped by the District’s date/time stamp machine at the place designated for submittal of the Bid Proposal. The date/time stamp is controlling and determinative as to the date and time of the Bidder’s submittal of its Bid Proposal. Bid Proposals received after the date and time specified in the Call for Bids are non-responsive and will be returned to the Bidder unopened.
- D. Alternate Bid Item(s).** If the Bid Proposal forms do not specifically call for the submittal of alternate bid item(s) and a Bidder submits alternate bid item(s), the District may deem the Bid Proposal to be non-responsive and reject the same. In the event that alternate item(s) are specifically called for in the Bid Proposal forms, any Bid Proposal which does not include bid(s) for the alternate item(s) may result in the Bid Proposal being deemed by the District to be non-responsive and rejected. In the event that bids for alternate item(s) are specifically called for in the Bid Proposal forms, the Bidder is referenced to the provisions of the Contract Documents permitting the District, during performance of the Work of the Contract Documents, to add or delete such alternate item(s) with the cost or

credit (inclusive of all direct and indirect costs, supervision, overhead and profit) for such alternate item(s) to be in the amount(s) set forth in the Bidder's Bid Proposal for such alternate item(s).

- 1.02 Bid Security.** Bid Security shall be in the form of: (a) cash, (b) a certified or cashier's check made payable to the District or (c) a Bid Bond, in the form and content attached hereto, in favor of the District executed by the Bidder as a principal and an Admitted Surety Insurer under Code of Civil Procedure §§995.120 and 995.311 as surety (the "Bid Security") in an amount not less than the stated percentage of the maximum amount of the Bid Proposal. Any Bid Proposal submitted without the required Bid Security is non-responsive and will be rejected.
- 1.03 Signatures.** All bid forms shall be executed by an individual duly authorized to execute the same on behalf of the Bidder.
- 1.04 Modifications.** Changes to the Bid Proposal which are not specifically called for or permitted may result in the District's rejection of the Bid Proposal as being non-responsive. No oral or telephonic modification of any submitted Bid Proposal will be considered. A written modification may be considered only if actually received by the District ten (10) days prior to the scheduled closing time for receipt of Bid Proposals.
- 1.05 Erasures; Inconsistent or Illegible Bid Proposals.** Bid Proposals must not contain any erasures, interlineations or other corrections unless the same are suitably authenticated by affixing in the margin immediately opposite such erasure, interlineation or correction the surname(s) of the person(s) signing the Bid Proposal. Any Bid Proposal not conforming to the foregoing may be deemed by the District to be non-responsive. If any Bid Proposal, or portions thereof, is determined by the District to be illegible, ambiguous or inconsistent, the District may reject such a Bid Proposal as being non-responsive.
- 1.06 Examination of Site and Contract Documents.** Each Bidder shall, at its sole cost and expense, inspect the Site to become fully acquainted with the Contract Documents and conditions affecting the Work. The failure of a Bidder to receive or examine any of the Contract Documents or to inspect the Site shall not relieve such Bidder from any obligation with respect to the Bid Proposal, the Contract or the Work required under the Contract Documents. The District assumes no responsibility or liability to any Bidder for, nor shall the District be bound by, any understandings, representations or agreements of the District's agents, employees or officers concerning the Contract Documents or the Work made prior to execution of the Contract. Bidder is charged with all information and knowledge that a reasonable bidder would ascertain from having performed this required work, investigation, research, and analysis. Bid prices must include entire cost of all work "incidental" to completion of the Work. The submission of a Bid Proposal shall be deemed prima facie evidence of the Bidder's full compliance with the requirements of this section.

1061 Conditions Shown on the Contract Documents: Information as to underground conditions, as-built conditions, or other conditions or obstructions, indicated in the Contract Documents has been obtained with reasonable care, and has been recorded in good faith. However, District only warrants, and Contractor may only rely on, the accuracy of limited type of information as set forth herein.

(a) As to above-ground conditions or as-built conditions shown or indicated in the Contract Documents, there is no warranty, express or implied, or any representation express or implied, that such information is correctly shown or indicated. This information is verifiable by independent investigation and Contractor is required to make such verification as a condition to bidding. In submitting its Bid, Contractor shall rely on the results of its own independent investigation. In submitting its Bid, Contractor shall not rely on District-supplied information regarding above ground conditions or as-built conditions.

(b) As to any subsurface condition shown or indicated in the Contract Documents, Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated. District is not responsible for the completeness of such information for bidding or construction; nor is District responsible in any way for any conclusions or opinions of Contractor drawn from such information; nor is the District responsible for subsurface conditions that are not specifically shown (for example, District is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown).

1062 Conditions Shown in Reports and Drawings Supplied for Information Purposes: Any reports of explorations or tests of subsurface conditions at or contiguous to the Site that have been utilized by Architect in preparing the Contract Documents are not Contract Documents and, except for any “technical” data regarding subsurface conditions specifically identified in such reports and underground facilities data, Contractor may not in any manner rely on the information in these reports and drawings. Subject to the foregoing, Contractor must make its own independent investigation of all conditions affecting the Work and must not rely on information provided by District.

1063 Site Investigation. Each Bidder shall complete the tasks listed below as a condition to bidding, and submission of a Bid shall constitute the Bidder’s express representation to District that Bidder has fully completed the following:

(a) Bidder has visited the Site and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as built conditions, and all local conditions and federal state and local laws, and regulations that in any manner may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of

construction to be employed by Bidder and safety precautions and programs incident thereto;

(b) Bidder has conducted or obtained and has understood all examinations, investigations, explorations, tests, reports, and studies that pertain to the subsurface conditions, as built conditions, underground facilities, and all other physical conditions at or contiguous to the Site or otherwise that may affect the cost, progress, performance, or furnishing of Work, as Bidder considers necessary for the performance or furnishing of Work at the Contract Price, within the Contract Time, and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies, or similar information or data are or will be required by Bidder for such purposes;

(c) Bidder has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, test, reports, and studies with the terms and conditions of the Contract Documents;

(d) Bidder has given the District prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and actual conditions, and the written resolution thereof by the District is acceptable to Bidder; and

(e) Bidder has made a complete disclosure in writing to the District of all facts bearing upon any possible interest, direct or indirect, that Bidder believes any representative of the District or other officer or employee of the District presently has or will have in this Contract or in the performance thereof or in any portion of the profits thereof.

1.07 **Withdrawal of Bid Proposal.** Any Bidder may withdraw its Bid Proposal without penalty by written request received by the District prior to the scheduled closing time for the receipt of Bid Proposals. Requests for withdrawal of bid proposals after scheduled closing time shall be in accordance with Public Contract Code §§5100 et seq.

1.08 **Documents Required Upon Award of Contract.** The Agreement which the successful Bidder, as Contractor, will be required to execute along with the other documents which will be required to be furnished are included in the Contract Documents and shall be carefully examined by the Bidder.

1.09 **Interpretation of Drawings, Specifications or Contract Documents.** Any Bidder in doubt as to the true meaning of any part of the Contract Documents or who finds discrepancies, errors or omissions therein; or who finds variances in any of the Contract Documents with applicable rules, regulations, ordinances and/or laws, may submit to the

District a written request for an interpretation or correction thereof. It is the sole and exclusive responsibility of the Bidder to submit such request not less than eleven (11) days prior to the scheduled closing for the receipt of Bid Proposals. Interpretations or corrections of the Contract Documents will be by written addendum issued by the District, a copy of which will be sent to each Bidder who attends the mandatory pre-bid job walk. No person is authorized to render an oral interpretation or correction of any portion of the Contract Documents to any Bidder, and no Bidder is authorized to rely on any such oral interpretation or correction. Failure to request interpretation or clarification of any portion of the Contract Documents pursuant to the foregoing is a waiver of any discrepancy, defect or conflict therein.

- 1.10 Request for Substitutions Prior to Bid Opening.** By action of the District's Board of Trustees taken on January 14, 2004 pursuant to Public Contract Code §3400, the District has adopted District Standards ("Standard Specifications") specifying certain products, materials, systems, equipment and supplies (see Section 01010 of the Contract Specifications). Any Bidder may submit Request(s) for Substitution on the form provided herein, together with all substantiating data, no later than fourteen (14) days prior to the scheduled closing time for receipt of the Bid Proposals, in accordance with Public Contract Code §3400, for any products, materials, systems, equipment or supplies other than those set forth in the District's Standard Specifications. The District shall use its best efforts to consider and act upon such Request for Substitution in a timely fashion. Actions taken, if any, concerning the Request for Substitution will be by written addendum issued by the District, a copy of which will be sent to each Bidder who attends the mandatory pre-bid job walk. In the absence of written addendum, the Request for Substitution shall be deemed denied for purposes of the District's evaluation of the Bid Proposals and award of the Contract.
- 1.11 District's Right to Modify Contract Documents.** Before the scheduled closing time for receipt of Bid Proposals, the District may modify the Work, the Contract Documents, or any portion(s) thereof by the issuance of written addenda disseminated to all Bidders who have attended the mandatory pre-bid job walk. If the District issues any addenda, the failure of any Bidder to acknowledge such addenda in its Bid Proposal may render the Bid Proposal non-responsive.
- 1.12 Bidders Interested in More Than One Bid Proposal.** No person, firm, corporation or other entity shall submit or be interested in more than one Bid Proposal for the same Work; provided, however, that a person, firm or corporation that has submitted a sub-proposal to a Bidder or who has quoted prices for materials to a Bidder is not thereby disqualified from submitting a sub-proposal, quoting prices to other Bidders or submitting a Bid Proposal for the proposed Work to the District.
- 1.13 Bidder's Qualifications.** Each Bidder shall submit with its Bid Proposal a Statement of Bidder's Qualifications which is included within the Contract Documents. All

information required by the Statement of Bidder's Qualifications shall be completely and fully provided. Any Bid Proposal not accompanied by the Statement of Bidder's Qualifications completed with all information required and bearing the signature of the Bidder's duly authorized representative under penalty of perjury will render the Bid Proposal non-responsive and rejected. If the District determines that any information provided by a Bidder in the Statement of Bidder's Qualifications is false or misleading, or is incomplete so as to be false or misleading, the District may reject the Bid Proposal submitted by such Bidder as being non-responsive.

1.14 Award of Contract

- A. Waiver of Irregularities or Informalities.** The District reserves the right to reject any and all Bid Proposals or to waive any irregularities or informalities in any Bid Proposal or in the bidding.
- B. Award to Lowest Responsive Responsible Bidder.** The District proposes to award a separate Contract for Work for each of the five school sites identified in the Bid Proposal. The award of the Contract for each school site, if any, will be to the responsible Bidder submitting the lowest responsive bid for that school site in its Bid Proposal on the basis of the school site Base Bid Proposal, or the school site Base Bid Proposal and Alternate Bid Items, if any, selected in accordance with these Instructions for Bidders.
- C. Selection of Alternate Bid Items; Basis of Award of Contract.** The selection of Bid Alternates for determination of the lowest Bid Proposal will be based upon the Base Bid Proposal alone or a combination of the Base Bid Proposal and one or more Bid Alternates as selected by the District in accordance with the following "blind bidding" procedures. After opening timely submitted Bid Proposals and before the public reading of the Bid Proposals, District staff who will not be engaged in the selection of Bid Alternates ("Clerical Staff") will assign each Bidder an alphabetical letter for identification purposes. The Clerical Staff will mask all portions of the Bid Proposal and other documents submitted with Bid Proposals so that the identity of each Bidder and each listed subcontractor is not revealed. The Clerical Staff will maintain a list ("Bidders List") which identifies each Bidder's name and a corresponding alphabetical letter assigned to each Bidder. After completing the Bidders List, the Clerical Staff will publicly read the Bid Proposal amounts of each Bidder for the Base Bid as well as each Bid Alternate. In this public reading, Bidders will not be identified by name, only by alphabetical letter assigned to each Bidder. After the public reading of Bid Proposals, the Clerical Staff will provide the Project Manager, Architect and District staff responsible for selection of Bid Alternates ("Review Team") copies of the Bid Proposals with the identities of Bidders and listed subcontractors masked. Bid Proposals reviewed by the Review Team will identify Bidders only

by alphabetical letters. At such time as the Review Team has completed its review of the Bid Proposals, has selected Bid Alternates and has determined which Bidder (by the alphabetical letter designation assigned by Clerical Staff) has submitted the lowest Bid Proposal based upon the Base Bid and any combination of the Bid Alternates as determined by the Review Team, the Clerical Staff will make available to the Review Team the Bidders List so that the identity of the Bidder to be awarded the Contract can be identified. Until such time as the Review Team has completed review of Bid Proposals and determination of which Bidder has submitted the lowest responsive Bid Proposal, there will be no communication between members of the Clerical Staff and members of the Review Team regarding the identities of Bidders or listed subcontractors or any disclosure of any portion of the Bidders List.

- D. Alternate Bid Items Not Included in Award of Contract.** During performance of the Work, it is the District's option to add or delete from the scope of the Work Alternate Bid Items that were not included in the award of Contract. District may elect to have work done at price(s) set forth in the Alternate Bid Items Proposal.
- E. Responsive Bid Proposal.** A responsive Bid Proposal shall mean a Bid Proposal which conforms, in all material respects, to the Bid and Contract Documents.
- F. Responsible Bidder.** A responsible Bidder is a Bidder who has the capability in all respects to perform fully the requirements of the Contract Documents and the moral and business integrity and reliability that will assure good faith performance. In determining responsibility, the following criteria will be considered: (i) the ability, capacity and skill of the Bidder to perform the Work of the Contract Documents; (ii) whether the Bidder can perform the Work promptly and within the time specified, without delay or interference; (iii) the character, integrity, reputation, judgment, experience and efficiency of the Bidder; (iv) the quality of performance of the Bidder on previous contracts, by way of example only, the following information will be considered: (a) the administrative, consultant or other cost overruns incurred by the District on previous contracts with the Bidder; (b) the Bidder's compliance record with contract general conditions on other projects; (c) the submittal by the Bidder of excessive and/or unsubstantiated extra cost proposals and claims on other projects; (d) the Bidder's record for completion of work within the contract time and the Bidder's compliance with the scheduling and coordination requirements on other projects; (e) the Bidder's demonstrated cooperation with the District and other contractors on previous contracts; (f) whether the work performed and materials furnished on previous contracts was in accordance with the Contract Documents; (v) the previous and existing compliance by the Bidder with laws and ordinances relating to contracts; (vi) the sufficiency of the financial resources and ability of the Bidder to perform the work of the Contract Documents; (vii) the quality, availability and

adaptability of the goods or services to the particular use required; (viii) the ability of the Bidder to provide future maintenance and service for the warranty period of the Contract; (ix) whether the Bidder is in arrears on debt or contract or is a defaulter on any surety bond; (x) such other information as may be secured by the District having a bearing on the decision to award the Contract, to include without limitation the ability, experience and commitment of the Bidder to properly and reasonably plan, schedule, coordinate and execute the Work of the Contract Documents and whether the Bidder has ever been debarred from bidding or found ineligible for bidding on any other projects. The ability of a Bidder to provide the required bonds will not of itself demonstrate responsibility of the Bidder. Upon request of the District, Bidder must promptly submit satisfactory evidence of any of the items listed above.

1.15 Subcontractors

- A. Designation of Subcontractors; Subcontractors List.** Each Bidder shall submit a list of its proposed Subcontractors for the proposed Work as required by the Subletting and Subcontracting Fair Practices Act (Public Contract Code §§4100 et seq.) on the form furnished (Section 00215). The District may request that one or more apparent low Bidders provide to the District within seventy two (72) hours of bid opening the license numbers and value of work for each listed subcontractor submitted by Bidder. Any Bidder's failure to comply with the District's request may deem such Bidder's bid non-responsive and subject to rejection by the District.
- B. Work of Subcontractors.** The organization or arrangements of the Specifications and Drawings shall not limit the extent of the Work of the Contract Documents. Accordingly, all Bidders are encouraged to disseminate all of the Specifications, Drawings and other Contract Documents to all persons or entities submitting sub-bids to the Bidder. The omission of any portion or item of Work from the Bid Proposal or from the sub-bidders' sub-bids which is reasonably inferable from the Contract Documents is not a basis for adjustment of the Contract Price or the Contract Time.

1.16 Workers' Compensation Insurance. Pursuant to California Labor Code §3700, the successful Bidder shall secure Workers' Compensation Insurance for its employees engaged in the Work of the Contract. The successful bidder shall sign and deliver to the District the Workers Compensation Insurance certificate provided in Section 00415 prior to performing any of the Work under the Contract.

1.17 Bid Security Return. The Bid Security of three or more low Bidders, the number being solely at the discretion of the District, will be held by the District for ten (10) days after the period for which Bid Proposals must be held open (which is set forth in the Call for

Bids) or until posting by the successful Bidder(s) of the bonds, certificates of insurance required and return of executed copies of the Agreement, whichever first occurs, at which time the Bid Security will be returned to them.

- 1.18 Forfeiture of Bid Security.** If the Bidder awarded the Contract fails or refuses to execute the Agreement within ten (10) days from the date of receiving notification that it is the Bidder to whom the Contract has been awarded, the District may declare the Bidder's Bid Security forfeited as damages caused by the failure of the Bidder to enter into the Contract and may thereupon award the Contract for the Work to the responsible Bidder submitting the next lowest responsive Bid Proposal or may call for new bids, in District's sole and exclusive discretion.
- 1.19 Contractor's License.** No Bid Proposal will be considered from a Bidder who, at the time Bid Proposals are opened, is not licensed to perform the Work of the Contract Documents, in accordance with the Contractors License Law, California Business & Professions Code §§7000 et seq. This requirement is not a mere formality and cannot be waived by the District or its Board of Trustees. The required California Contractor's License classification(s) for the Work is set forth in the Call for Bids. The Contractor will be required to maintain the license(s) through the duration of the Contract. Any questions concerning a Contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 2600, Sacramento, CA 95826.
- 1.20 Anti-Discrimination.** It is the policy of the District that there be no discrimination against any prospective or active employee engaged in the Work because of race, color, ancestry, national origin, religious creed, sex, age or marital status. All Bidders agree to comply with the District's anti-discrimination policy and all applicable Federal and California anti-discrimination laws including but not limited to the California Fair Employment & Housing Act beginning with California Government Code §12940 et seq. and California Labor Code §1735. In addition, all Bidders agree to require like compliance by any Subcontractor employed by them on the Work of the Contract.
- 1.21 Mandatory Job-Walk.** The District will conduct a Mandatory Job Walk at the time and place designated in the Call for Bids. The District may, in its sole and exclusive discretion, elect to conduct one or more Job Walks in addition to that set forth in the Call for Bids, in which event the District shall notify all Bidders who have obtained the Contract Documents pursuant to the Call for Bids of any such additional Job Walk. If the District elects to conduct any Job Walk in addition to that set forth in the Call for Bids, the District shall, in its notice of any such additional Job Walks, indicate whether Bidders' attendance at such additional Job-Walks is/are mandatory; in the event that any such additional Job-Walks is/are designated as being mandatory, the provisions of this section 1.21 shall be deemed to apply to such additional Job-Walks. The failure of any Bidder to have its authorized representative present at the Job Walk will be grounds for the District to reject such bid and the Bid Proposal will be returned to the Bidder

unopened. A Bidder may have more than one authorized representative and/or representatives of its Subcontractors present at the Job Walk; provided, however that attendance by representatives of the Bidder's Subcontractors without attendance by a representative of the Bidder shall not be sufficient to meet the Bidder's obligations hereunder and will be grounds for the District to declare the Bid Proposal of such Bidder to be non-responsive.

- 122 Drug Free Workplace Certificate.** In accordance with California Government Code §§8350 et seq., the Drug Free Workplace Act of 1990, the successful Bidder will be required to execute a Drug Free Workplace Certificate concurrently with execution of the Agreement. The successful Bidder will be required to implement and take the affirmative measures outlined in such provisions. Failure of the successful Bidder to comply with the measures outlined in such provisions may result in penalties, including without limitation, the termination of the Agreement, the suspension of any payment of the Contract Price otherwise due under the Contract Documents and/or debarment of the successful Bidder.
- 123 Compliance with Immigration Reform and Control Act of 1986.** The Bidder is solely and exclusively responsible for employment of individuals for the Work of the Contract in conformity with the Immigration Reform and Control Act of 1986, 8 USC §§1101 et seq. ("IRCA"); the successful Bidder shall also require that any person or entity employing labor in connection with any of the Work of the Contract shall so similarly comply with the IRCA.
- 124 Notice of Intent to Award Contract.** Following the public opening and reading of Bid Proposals, the District will issue a Notice of Intent to Award the Contract, identifying the Bidder to whom the District intends to award the Contract and the date/time/place of the District's Board of Trustees meeting at which award of the Contract will be considered.
- 125 Bid Protest.** Any Bidder submitting a Bid Proposal to the District may file a protest of the District's intent to award the Contract provided that each and all of the following are complied with:
- A.** The bid protest is in writing;
 - B.** The bid protest is filed and received by the District's Assistant Superintendent, Business & Fiscal Services ("Assistant Superintendent") not more than five (5) calendar days following the date of issuance of the District's Notice of Intent to Award the Contract; and
 - C.** The written bid protest sets forth, in detail, all grounds for the bid protest, including without limitation all facts, supporting documentation, legal authorities and argument in support of the grounds for the bid protest; any matters not set forth in the written bid protest shall be deemed waived. All factual contentions

must be supported by competent, admissible and creditable evidence.

Any bid protest not conforming to the foregoing shall be rejected by the District as invalid. Provided that a bid protest is filed in strict conformity with the foregoing, the District's Assistant Superintendent or designee shall review and evaluate the basis of the bid protest. The District's Assistant Superintendent or designee shall provide the Bidder submitting the bid protest with a written statement concurring with or denying the bid protest. The District's Board of Trustees will render a final determination and disposition of a bid protest by taking action to adopt, modify or reject the disposition of a bid protest as reflected in the written statement of the District's Assistant Superintendent or designee. Action by the District's Board of Trustees relative to a bid protest shall be final and not subject to appeal or reconsideration by the District, any employee or officer of the District or the District's Board of Trustees. The issuance of a written statement by the Assistant Superintendent (or designee) and subsequent action by the District's Board of Trustees shall be express conditions precedent to the institution of any legal or equitable proceedings relative to the bidding process, the District's intent to award the Contract, the District's disposition of any bid protest or the District's decision to reject all Bid Proposals. In the event that any such legal or equitable proceedings are instituted and the District is named as a party thereto, the prevailing party(ies) shall recover from the other party(ies), as costs, all attorneys' fees and costs incurred in connection with any such proceeding, including any appeal arising therefrom.

- 126 Public Records.** All documents included in Bid Proposals become the exclusive property of the District upon submittal to the District. All Bid Proposals and other documents submitted in response to the Call for Bids become a matter of public record, except for information contained in such Bid Proposals deemed to be Trade Secrets (as defined in California Civil Code §3426.1). Financial documents submitted in support of a Bidder's Statement of Qualifications will not be disclosed by the District nor become a matter of public record pursuant to California Government Code §6255. However, A Bidder that indiscriminately marks all or most of its Bid Proposal as exempt from disclosure as a public record, whether by the notations of "Trade Secret," "Confidential," "Proprietary," or otherwise, may render the Bid Proposal non-responsive and rejected. The District is not liable or responsible for the disclosure of such records, including those exempt from disclosure if disclosure is deemed required by law, by an order of Court, or which occurs through inadvertence, mistake or negligence on the part of the District or its officers, employees or agents. At such time as Bid Proposals are deemed a matter of public record, pursuant to the above, any Bidder or other party shall be afforded access for inspection and/or copying of such Bid Proposals, by request made to the District in conformity with the California Access to Public Records Act, California Government Code §§6250, et. seq.

127 Prevailing Wage Rates, Employment of Apprentices.

- A. Payment of Prevailing Wage Rates.** The Bidder and all potential Subcontractors shall utilize the relevant prevailing wage rate determinations in the PREVAILING WAGE SCALE established by the Director of the Department of Industrial Relations in effect on the first advertisement date of the Notice to Contractors Calling For Bids in preparing the Bid Proposal and all component price quotations. Pursuant to Labor Code §1773.2, copies of these determinations are maintained at the District's Business Services offices located at 1051 South A Street, Oxnard, California 93030, and are available to any interested party upon request. Copies of rate schedules are also available on the Internet at http://www.dir.ca.gov/DIR/S&R/statistics_research.html.
- B. Notice to Subcontractors.** Bidders shall notify all potential Subcontractors submitting price quotations for portions of the Work of the requirements concerning payment of prevailing wage rates, payroll records, hours of work, and employment of apprentices set forth in Article 4.21 of Section 00700 (General Conditions).
- C. Fingerprinting.** The successful Bidder will be required to assure that its employees, subcontractors of any tier, material suppliers, and consultants do not have direct contact with the District's students during the performance of the Contract in compliance with Education Code §§45125.1 and 45125.2. To ensure these provisions, Bidder's employee supervising and monitoring all employees shall be fingerprinted, and proof of same shall be provided to the District prior to start of on-site Work. The supervising employee will continuously supervise and monitor all employees and workers while on school grounds. In addition, Bidder shall install physical barriers (fencing or other appropriate barricades) at the worksite to limit contact with students. All costs associated with these provisions are the responsibility of the Bidder.

END OF SECTION

SECTION 00210

BID PROPOSAL

TO: REEF SUNSET UNIFIED SCHOOL DISTRICT, a California School District, acting by and through its Board of Trustees ("District"), 205 N. Park Ave, Avenal, CA 93204.

FROM:

(Name of Bidder as listed on License)

(Address)

(City, State, Zip Code)

(Telephone)

(Fax)

(Name(s) of Bidder's Authorized Representative(s) & Title)

1.01 Bid Proposal.

A. Bid Proposal Amount. Pursuant to and in compliance with the Notice to Contractors Calling for Bids, the Instructions for Bidders and the other documents relating thereto, the undersigned Bidder, having reviewed the Instructions for Bidders and all other Contract Documents and upon compliance with all requirements therein with reference to the submittal of this Bid Proposal, hereby proposes and agrees to perform the Contract including, without limitation, all of its component parts; to perform everything required to be performed; to provide and furnish any and all of the labor, materials, tools, equipment, applicable taxes, and services necessary to perform the Work of the Contract in strict compliance with the Contract Documents and complete in a workmanlike manner all of the Work required for each school site Project described in **Bid No.## AVENAL E.S KINDERGARTEN PROJECT**

for the sum of:

1. AVENAL E.S KINDERGARTEN PROJECT:

Base Bid Amount:

\$ _____
(Base Bid Amount in Figures)

(Base Bid Amount in Words) Dollars

- B. If any of the following alternate bids are utilized and awarded, the undersigned agrees to make price adjustments, as indicated, to the Base Bid.

ALTERNATE BID 1: Electrical, Communication and Signal service as shown on Electrical Site Plan E2.1 and E2.2 on Addendum 01. Point of connection to Pull Box "PB-CS. P1, S2".

State the amount to be ☒ **added** ☐ **deducted** to/from the Base Bid for Alternate

Bid 1.

_____ dollars.
[written in words]

\$ _____.
[written in numbers]

ALTERNATE BID 2: Concrete Paving as shown A1.20 Partial Site Plan.

State the amount to be ☒ **added** ☐ **deducted** to/from the Base Bid for Alternate

Bid 2.

_____ dollars.
[written in words]

\$ _____.
[written in numbers]

NOTE: *The District is also requiring a Schedule of Values to be included as part of your Bid Proposal.*

- C. **Acknowledgment of Bid Addenda.** In submitting this Bid Proposal, the undersigned Bidder acknowledges receipt of all Bid Addenda issued by or on behalf of the District, as set forth below. The Bidder confirms that this Bid Proposal incorporates and is inclusive of, all items or other matters contained in Bid Addenda.

_____ **No Addenda Issued**
(initial)

_____ **Addenda Nos.** _____ **received, acknowledged and**
(initial) **incorporated into this Bid Proposal.**

1.02 Rejection of Bid; Holding Open of Bid. It is understood that the District reserves the right to reject this Bid Proposal and that this Bid Proposal shall remain open and not be withdrawn for the period of time specified in the Call for Bids, except as provided by law.

1.03 Documents Comprising Bid Proposal. The undersigned Bidder has submitted as its Bid Proposal the following:

1. Bid Proposal and Schedule of Values (00210);
2. List of Subcontractors (00215);
3. Non-Collusion Affidavit (00220);
4. PWC-100 OSD Contractors Data Form-DIR Registration (00225)
5. Bid Security (Cash/Cashier's Check/Certified Check/Bid Bond –00260);
6. DVBE (00520);

The Bidder acknowledges that if this Bid Proposal and the foregoing documents are not fully in compliance with applicable requirements set forth in the Call for Bids, the Instructions for Bidders and in each of the foregoing documents, the Bid Proposal may be rejected as non-responsive.

1.04 Award of Contract. It is understood and agreed that if written notice of the acceptance of this Bid Proposal and award of the Contract thereon is mailed or delivered by the

District to the undersigned after the opening of Bid Proposals and within the time this Bid Proposal is required to remain open or at any time thereafter before this Bid Proposal is withdrawn, the undersigned will execute and deliver to the District the Agreement in the form attached hereto in accordance with the Bid Proposal as accepted within seven (7) calendar days after notification of acceptance and award. Concurrently with delivery of the executed Agreement to the District, the Bidder awarded the Contract shall deliver to the District: (1) the Labor and Material Payment Bond; (2) the Performance Bond; (3) the Drug-Free Workplace Certificate; (4) Certificates of Insurance evidencing all insurance coverages required to be provided under the Contract Documents; (5) the Certificate of Workers' Compensation Insurance; (6) Fingerprinting Certificate; and (7) DVBE Participation Certificate. The Work under the Contract Documents shall be commenced by the undersigned Bidder, if awarded the Contract, on the date stated in the District's Notice to Proceed issued pursuant to the Contract Documents. Completion of the Work shall be achieved within the Contract Time specified in the Contract Documents.

1.05 Notices. All notices or other correspondence shall be addressed to the District and the Bidder at their respective addresses set forth herein. Notices shall be effective only if in writing and in conformity with the requirements for service of notices set forth in the Contract Documents.

1.06 Contractor's License. The undersigned Bidder is currently and duly licensed in accordance with the California Contractors License Law, California Business & Professions Code §§7000 et seq., under the following:

License Number: _____
Class _____ Expiration Date _____ Class _____ Expiration Date _____
Class _____ Expiration Date _____ Class _____ Expiration Date _____

By executing this Bid Proposal, the Bidder hereby certifies that: (a) it is duly licensed, in the necessary class(es), for performing the Work of the Contract Documents; (b) that such license shall be in full force and effect throughout the duration of the performance of the Work under the Contract Documents; and (c) that all Subcontractors providing or performing any portion of the Work of the Contract Documents shall be so similarly and appropriately licensed to perform or provide such portion of the Work.

1.07 Designation of Subcontractors. In compliance with the Subletting and Subcontracting Fair Practices Act (California Public Contract Code §§4100, et seq.) and amendments thereof, each Bidder shall set forth in the Subcontractors List: (a) the name and location of the place of business of each Subcontractor who will perform work or labor or render services to the Bidder in or about the construction of the Work to be performed under the Contract Documents in an amount in excess of one-half of one percent (0.5%) of the Bidder's Bid Proposal; and (b) the trade and/or portion of the Work which will be performed by each listed Subcontractor. The Bidder shall list only one Subcontractor for

each trade and/or portion of the Work as is defined by the Bidder in its Bid Proposal. If a Bidder fails to list a Subcontractor for a portion of the work in excess of one-half of one percent (0.5%) of the Bidder's Bid Proposal or if the Bidder specifies more than one Subcontractor for the same portion of Work to be performed under the Contract Documents valued in excess of one-half of one percent (0.5%) of the Bidder's Bid Proposal amount, the Bidder shall be deemed to have agreed that it is fully qualified to perform that portion of the Work itself and that it shall perform that portion of the Work.

1.08 Confirmation of Figures. By submitting this Bid Proposal, the Bidder confirms that it has checked all of the above figures and understands that neither the District nor any of its agents, employees or representatives shall be responsible for any errors or omissions on the part of the undersigned Bidder in preparing and submitting this Bid Proposal.

1.09 Acknowledgment and Confirmation. The undersigned Bidder acknowledges its receipt, review and understanding of the Drawings, the Specifications and other Contract Documents pertaining to the proposed Work. The undersigned Bidder certifies that the Contract Documents are, in its opinion, adequate, feasible and complete for providing, performing and constructing the Work in a sound and suitable manner for the use specified and intended by the Contract Documents. The undersigned Bidder certifies that it has, or has available, all necessary equipment, personnel, materials, facilities and technical and financial ability to complete the Work for the amount bid herein within the Contract Time and in accordance with the Contract Documents. The undersigned Bidder certifies that its bid amount includes funds sufficient to allow the Bidder to comply with all applicable local, state and federal laws and regulations governing the labor and services to be provided for the performance of the Work of the Contract and shall indemnify, defend and hold District harmless from and against any and all claims, demands, losses, liabilities and damages arising out of or relating to Bidder's failure to comply with applicable law in this regard.

THE UNDERSIGNED DECLARES UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE REPRESENTATIONS MADE IN THIS BID PROPOSAL ARE TRUE AND CORRECT.

By: _____
(Signature)

(Corporate Seal)

(Typed or Printed Name of Bidder's Authorized Representative)

Title: _____

END OF SECTION

SECTION 00215

– AVENAL E.S KINDERGARTEN PROJECT

Contractor's name

LIST OF SUBCONTRACTORS

1. Licensed Name of Subcontractor	2. Address of Office, Mill or Shop	3. Trade or Portion of Work	5. License No.	6. \$\$ Value of Work
			MUST BE Filled out	Fill out ONLY if requested by District
			MUST BE Filled out	Fill out ONLY if requested by District
			MUST BE Filled out	Fill out ONLY if requested by District
			MUST BE Filled out	Fill out ONLY if requested by District
			MUST BE Filled out	Fill out ONLY if requested by District
			MUST BE Filled out	Fill out ONLY if requested by District
			MUST BE Filled out	Fill out ONLY if requested by District

Name of Contractor: _____

Authorized Signature: _____

[Duplicate and attach additional page(s) as required.]

SECTION 00220

NON-COLLUSION AFFIDAVIT

STATE OF CALIFORNIA

COUNTY OF _____

I, _____ being first duly sworn, deposes and says that I
(Typed or Printed Name)
am the _____ of _____, the party
(Title) (Bidder Name)
submitting the foregoing Bid Proposal (the "Bidder"). In connection with the foregoing Bid Proposal, the undersigned declares, states and certifies that:

- 1.01 The Bid Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization or corporation.
- 1.02 The Bid Proposal is genuine and not collusive or sham.
- 1.03 The Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any other bidder or anyone else to put in sham bid, or to refrain from bidding.
- 1.04 The Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price, or that of any other bidder, or to fix any overhead, profit or cost element of the bid price or that of any other bidder, or to secure any advantage against the public body awarding the contract or of anyone interested in the proposed contract.
- 1.05 All statements contained in the Bid Proposal and related documents are true.
- 1.06 The Bidder has not, directly or indirectly, submitted the bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any person, corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Executed this _____ day of _____, 20____ at _____
(City, County and State)

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

Signature

(Address)

Name Printed or Typed

(City, County and State)

(_____)_____
(Area Code and Telephone Number)

SECTION 00260

BID BOND

KNOW ALL MEN BY THESE PRESENTS,

That we, _____, as Principal,
and _____, as Surety, are
held and firmly bound, along with our respective heirs, executors, administrators, successors and
assigns, jointly and severally, unto **REEF SUNSET UNIFIED SCHOOL DISTRICT**,
hereinafter "Obligee," for payment of the penal sum hereof in lawful money of the United States,
as more particularly set forth herein.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Principal has submitted the accompanying Bid Proposal for the Work
commonly described as **AVENAL E.S KINDERGARTEN PROJECT** and the Bid Proposal
must be accompanied by Bid Security.

WHEREAS, subject to the terms of this Bond, the Surety is firmly bound unto the Obligee
in the penal sum of **TEN PERCENT (10%)** of the maximum amount of the Bid Proposal
submitted by the Principal to the Obligee, as set forth above, inclusive of additive alternate bid
items, if any.

NOW THEREFORE, if the Principal shall not withdraw said Bid Proposal within the
period specified therein after the opening of the same, or, if no period be specified, for sixty (60)
days after opening of said Bid Proposal; and if the Principal is awarded the Contract, and shall
within the period specified therefore, or if no period be specified, within five (5) days after the
prescribed forms are presented to him for signature, enter into a written contract with the Obligee,
in accordance with the Bid Proposal as accepted, and give such bond(s) with good and sufficient
surety or sureties, as may be required, for the faithful performance and proper fulfillment of such
Contract and for the payment for labor and materials used for the performance of the Contract, or
in the event of the withdrawal of said Bid Proposal within the period specified for the holding open
of the Bid Proposal or the failure of the Principal to enter into such Contract and give such bonds
within the time specified, if the Principal shall pay the Obligee the difference between the amount
specified in said Bid Proposal and the amount for which the Obligee may procure the required
Work and/or supplies, if the latter amount be in excess of the former, together with all costs
incurred by the Obligee in again calling for Bids or otherwise procuring said Work or supplies,
then the above obligation shall be void and of no effect, otherwise to remain in full force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or the Call for Bids, the Work to be performed thereunder, the Drawings or the Specifications accompanying the same, or any other portion of the Contract Documents shall in any way affect its obligations under this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said Contract, the Call for Bids, the Work, the Drawings or the Specifications, or any other portion of the Contract Documents.

In the event that suit or other proceeding is brought upon this Bond by the Obligee, the Surety shall pay to the Obligee all costs, expenses and fees incurred by the Obligee in connection therewith, including without limitation, attorneys' fees.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this _____ day of _____, 20____ by their duly authorized agents or representatives.

Bidder:
(corporate Seal)

(Principal's Name)

By: _____
(Signature)

(Typed or Printed Name & Title)

(Address)

Surety
(Corporate Seal)

(Surety's Name)

By: _____
(Signature of Attorney-in-Fact for Surety)

(Attach Attorney-in-Fact Certificate)

(Typed or Printed Name)

(Address of Surety's Office where Bond is issued)

(Area Code and Telephone Number of Surety)

SECTION 00310

AGREEMENT # _____

THIS AGREEMENT is made this , in the City of Avenal, County of King's, State of California, by and between **REEF SUNSET UNIFIED SCHOOL DISTRICT**, a California School District, hereinafter called the "District" and _____, hereinafter called the "Contractor", with a principal place of business located at _____.

WITNESSETH, that the District and the Contractor in consideration of the mutual covenants contained herein agree as follows:

- 1.01 The Work.** Within the Contract Time and for the Contract Price, subject to adjustments thereto pursuant to the Contract Documents, the Contractor shall perform and provide all necessary labor, materials, tools, equipment, utilities, services and transportation to complete in a workmanlike manner and in strict compliance with the terms and conditions of the Contract Documents all of the Work required in connection with the work of improvement commonly referred to as:

Bid ##
AVENAL E.S. KINDERGARTEN PROJECT

Contractor shall complete all Work covered by the Contract Documents, including without limitation, the Drawings and Specifications prepared by the Architect, and other Contract Documents enumerated in Article 5 below, along with all modifications and addenda thereto, in strict accordance with the Contract Documents.

- 1.02 Contract Time.** Final completion of the work shall be achieved as indicated below:

Phase 1:

Construction Phase Start:

Final Completion:

Failure to achieve Final Completion within the Contract Time will result in the assessment of Liquidated Damages.

- 1.03 Contract Price.** The District shall pay the Contractor as full consideration for the Contractor's full, complete and faithful performance of the Contractor's obligations under the Contract Documents, subject to any additions or deduction as provided for in the Contract Documents, the Contract Price of _____ Dollars (\$ _____). The Contract Price is based upon the Contractor's Base Bid Proposal. The District's payment of the Contract Price shall be in accordance with the Contract Documents.

- 1.04 Liquidated Damages.** In the event of the failure or refusal of the Contractor to achieve Completion of the Work of the Contract Documents within the Contract Time, as adjusted, or

completion of the Interim Milestones as provided in the Contract Special Conditions, the Contractor shall be subject to assessment of Liquidated Damages in accordance with the Contract Documents.

1.05 The Contract Documents. The Contract Documents consist of the following:

Notice to Contractors Calling for Bids	PWC-100 OSD Contractors Data Form
Instructions for Bidders	Drug Free Workplace Certification
Bid Proposal	Fingerprinting Certificate
Subcontractors List	DVBE Participation Goal
Non-Collusion Affidavit	Guarantee
Bid Security	Project Forms
Agreement	General Conditions
Labor and Material Payment Bond	Special Conditions
Performance Bond	Specifications
Certificate of Workers Compensation	Drawings

1.06 Authority to Execute. The individual(s) executing this Agreement on behalf of the Contractor is/are duly and fully authorized to execute this Agreement on behalf of Contractor and to bind the Contractor to each and every term, condition and covenant of the Contract Documents.

IN WITNESS WHEREOF, this Agreement has been duly executed by the District and the Contractor as of the date set forth above.

DISTRICT

**REEF SUNSET UNIFIED SCHOOL
DISTRICT,**
a California School District

By: _____
Khai Nyugen, CBO

CONTRACTOR

(Contractor's License Number)

By: _____

Name: _____

Title: _____
(Corporate Seal)

END OF SECTION

SECTION 00400

**LABOR AND MATERIAL PAYMENT BOND
CIVIL CODE §3247**

KNOW ALL MEN BY THESE PRESENTS,

That we, _____, as Principal, and _____, as Surety, are held and firmly bound, along with our respective heirs, executors, administrators, successors and assigns, jointly and severally, unto **REEF SUNSET UNIFIED SCHOOL DISTRICT**, hereinafter "Obligee", for payment of the penal sum of _____ Dollars (\$) in lawful money of the United States, as more particularly set forth herein.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Obligee, by resolution of its Board of Education, has awarded to the Principal a Contract for the Work commonly described as:

AVENAL E.S KINDERGARTEN PROJECT

WHEREAS, the Principal, on or about _____, 20_, entered into a Contract with the Obligee for performance of the Work; the Agreement and all other Contract Documents set forth therein are incorporated herein and made a part hereof by this reference.

WHEREAS, by the terms of the Contract Documents, the Principal is required to furnish a bond for the prompt, full and faithful payment to any Claimant, as hereinafter defined, for all labor, materials or services used, or reasonably required for use, in the performance of the Work.

NOW THEREFORE, if the Principal shall promptly, fully and faithfully make payment to any Claimant for all labor, materials or services used or reasonably required for use in the performance of the Work, then this obligation shall be void; otherwise, it shall be, and remain, in full force and effect.

The term "Claimant" shall refer to any person, corporation, partnership, proprietorship or other entity including without limitation, all persons and entities described in California Civil Code §3181, providing or furnishing labor, materials or services used or reasonably required for use in the performance of the Work under the Contract Documents, without regard for whether such labor, materials or services were sold, leased or rented. This Bond shall inure to the benefit of all Claimants so as to give them, or their assigns and successors, a right of action upon this Bond.

In the event that suit is brought on this Bond by any Claimant for amounts due such Claimant for labor, materials or services provided or furnished by such Claimant, the Surety shall pay for the same and reasonable attorneys' fees pursuant to California Civil Code §3250.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or to the specifications or other Contract Documents, shall in anyway affect the Surety's obligations under this Bond, and Surety does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, to the Work, to the specifications or other Contract Documents.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this _____ day of _____, 20____ by their duly authorized agents or representatives.

(Corporate Seal)

(Principal Name)

By: _____
(Signature)

(Typed or Printed Name)

Title: _____

(Corporate Seal)

(Surety Name)

By: _____
(Signature of Attorney-in-Fact for Surety)

(Typed or Printed Name of Attorney-in-Fact)

(Attach Attorney-in-Fact Certificate)

(Address)

(Area Code and Telephone Number of Surety)

SECTION 00410

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS,

That we _____, as Principal,
and _____, as Surety, are
held and firmly bound, along with our respective heirs, executors, administrators, successors and
assigns, jointly and severally, unto **REEF SUNSET UNIFIED SCHOOL DISTRICT**,
hereinafter "Obligee", for payment of the penal sum of _____
Dollars (\$)) in lawful money of the United States, as more particularly set forth herein.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Obligee, by action of its Board of Education, has awarded to the Principal
a Contract for the Work commonly described as:

**BID ##
AVENAL E.S KINDERGARTEN PROJECT**

WHEREAS, the Principal, on or about _____20_, entered into a contract with
the Obligee for performance of the Work; the Agreement and all other Contract Documents set
forth therein are incorporated herein and made a part hereof by this reference.

WHEREAS, by the terms of the Contract Documents ("Contract"), the Principal is required
to furnish a bond ensuring the Principal's prompt, full and faithful performance of the Work of the
Contract.

WHEREAS, the Principal and the Surety, jointly and severally, bind themselves, their
heirs, executors, administrative, successors and assigns, to the Obligee for the prompt, full and
faithful performance of the Contract, which is incorporated herein by this reference.

NOW, THEREFORE, if the Principal shall promptly, fully and faithfully perform each and
all of the obligations and things to be done and performed by the Principal in strict accordance
with the terms of the Contract as said Contract may be modified or amended from time to time;
and if the Principal shall indemnify and save harmless the Obligee and all of its officers, agents
and employees from any and all losses, liability and damages, claims, judgments, stop notices,
costs, and fees of every description, whether imposed by law or equity, which may be incurred by
the Obligee by reason of the failure or default on the part of the Principal in the performance of
any or all of the terms or the obligations of the Contract, including all modifications and
amendments thereto, and any warranties or guarantees required thereunder; then this obligation
shall be void; otherwise, it shall be, and remain, in full force and effect.

In the event the Principal is declared by the Obligor to be in breach or default in the performance of the Contract, then, after written notice from the Obligor to the Surety, as provided for herein, the Surety shall either remedy the default or breach of the Principal or shall take charge of the Work of the Contract and complete the Contract with a Contractor other than the Principal at its own expense; provided, however, that the procedure by which the Surety undertakes to discharge its obligations under this Bond shall be subject to the advance written approval of the Obligor.

If the Surety does not proceed to cure or remedy the Principal's default(s) of its performance of the Contract with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen (15) calendar days after receipt of a written notice from Obligor to the Surety demanding that the Surety perform its obligations under this Bond, and the Obligor shall be entitled to enforce any remedy available to Obligor.

Within fifteen (15) calendar days of Obligor's written notice to the Surety of the failure of performance of the Contract by the Principal, it shall be the duty of the Surety to give to the Obligor an unequivocal notice in writing of the Surety's election to remedy the default(s) of the Principal promptly, or to arrange for performance of the Contract promptly by a Contractor other than the Principal, time being of essence to this Bond. In said Notice of Election, the Surety shall state the date of commencement of its cure or remedy of the Principal's default(s) or its performance of the Contract. The Surety's obligations for cure or remedy, include but are not limited to: correction of defective or incomplete work and completion of the Contract, additional legal, design professional and delay costs arising from Surety's actions or failure to act; and liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance by the Principal. The Surety shall give prompt written notice to the Obligor upon completion of the cure or remedy of the Principal's default(s) of its performance of the Contract.

In the event the Surety shall fail to issue its Notice of Election to Obligor within the time provided for herein above, the Obligor may thereafter cause the cure or remedy of the Principal's failure of performance or default or to complete the Work. The Principal and the Surety shall be each jointly and severally liable to the Obligor for all damages and costs sustained by the Obligor as a result of the Principal's failure of performance under the Contract Documents or default in its performance of obligations thereunder, including without limitation the costs of cure or completion exceeding the then remaining balance of the Contract Price.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, including but not limited to the Contract Amount, or to the Work to be performed thereunder or to the specifications or other Contract Documents, shall in anyway affect the Surety's obligations under this Bond, and Surety does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, to the Work, to the specifications or other Contract Documents.

Principal and Surety agree that if Obligor is required to engage the services of an attorney in connection with enforcement of this Bond, each shall pay Obligor's costs and reasonable

attorney's fees incurred, with or without suit, in addition to the above penal sum.

The guarantees contained in this Bond survive Final Completion of the Work called for in the Contract Documents with respect to the obligations and liabilities of the Principal, which survive Final Completion of the Work.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this _____ day of _____, 20__ by their duly authorized agents or representatives.

(Corporate Seal)

(Principal Name)
By: _____
(Signature)

(Typed or Printed Name)
Title: _____

(Corporate Seal)

(Surety Name)
By: _____
(Signature of Attorney-in-Fact for Surety)

(Attach Attorney-in-Fact Certificate)

(Typed or Printed Name of Attorney-in-Fact)

(Address)

(Area Code and Telephone Number of Surety)

SECTION 00415

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

I, _____ the _____,
(Name) (Title)
of _____, declare, state and certify that:
(Company Name)

1.01 I am aware that California Labor Code §3700(a) and (b) provides:

"Every employer except the state shall secure the payment of compensation in one or more of the following ways:

- A. By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this state.
- B. By securing from the Director of Industrial Relations a certificate of consent to self-insure either as an individual employer, or one employer in a group of employers, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees."

1.02 I am aware that the provisions of California Labor Code §3700 require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of this Contract.

By: _____
(Signature)

(Date)

SECTION 00417

DRUG-FREE WORKPLACE CERTIFICATION

I, _____ the _____,
(Name) (Title)
of _____, declare, state and certify that:
(Contractor Name)

- 1.01 I am aware of the provisions and requirements of California Government Code §§8350 et seq., the Drug Free Workplace Act of 1990.
- 1.02 I am authorized to certify, and do certify, on behalf of Contractor that a drug free workplace will be provided by Contractor by doing all of the following:
- A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in Contractor's workplace and specifying actions which will be taken against employees for violation of the prohibition;
 - B. Establishing a drug-free awareness program to inform employees about all of the following:
 - 1. The dangers of drug abuse in the workplace;
 - 2. Contractor's policy of maintaining a drug-free workplace;
 - 3. The availability of drug counseling, rehabilitation and employee- assistance programs; and
 - 4. The penalties that may be imposed upon employees for drug abuse violations;
 - C. Requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by subdivision (A), above, and that as a condition of employment by Contractor in connection with the Work of the Contract, the employee agrees to abide by the terms of the statement.
- 1.03 Contractor agrees to fulfill and discharge all of Contractor's obligations under the terms and requirements of California Government Code §8355 by, inter alia, publishing a statement notifying employees concerning: (a) the prohibition of any controlled substance in the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the Work of the Contract be given a copy of the statement required by California Government Code §8355(a) and requiring that the employee agree to abide by the terms of that statement.

1.04 Contractor and I understand that if the District determines that Contractor has either: (a) made a false certification herein, or (b) violated this certification by failing to carry out and to implement the requirements of California Government Code §8355, the Contract awarded herein is subject to termination, suspension of payments, or both. Contractor and I further understand that, should Contractor violate the terms of the Drug-Free Workplace Act of 1990, Contractor may be subject to debarment in accordance with the provisions of California Government Code §§8350, et seq.

1.05 Contractor and I acknowledge that Contractor and I are aware of the provisions of California Government Code §§8350, et seq. and hereby certify that Contractor and I will adhere to, fulfill, satisfy and discharge all provisions of and obligations under the Drug-Free Workplace Act of 1990.

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

Executed at _____ this _____ day of _____, 20____
(City and State)

(Signature)

(Typed or Printed Name)

SECTION 00510

BACKGROUND CHECK AND FINGERPRINTING PROCEDURES FOR CONTRACTORS

The successful Bidder will be required to assure that its employees, subcontractors of any tier, material suppliers, and consultants do not have direct contact with the District's students during the performance of the Contract in compliance with Education Code §§ 45125.1 and 45125.2. To assure these provisions, the successful Bidder's supervisor shall be fingerprinted, and proof of same shall be provided to the District prior to start of on-site work. The supervisor will monitor the workers' conduct while on school grounds. In addition, the successful Bidder shall barricade the Work area to separate its workers from the students. Costs associated with this process are the responsibility of the successful Bidder.

The Contractors' construction supervisors or their unsupervised employees who will be working outside of fenced areas during the school hours **must** have submitted a fingerprint identification card to the Department Of Justice (DOJ) and have a proof of clearance in the form of an affidavit filed in the Oxnard School District's Purchasing Office **prior to** the start of the Work.

California Education Code §§45125.1 and 45125.2 require that criminal checks be completed for contractors (Contracting Firm) who provide architectural, construction, janitorial, administrative, landscape, transportation, food-related, or other similar services to school districts.

The undersigned does hereby certify to the Board of Trustees of the REEF SUNSET UNIFIED School District as follows:

That I am a representative of the Contractor currently under contract ("Contract") with the District; that I am familiar with the facts herein certified, and am authorized and qualified to execute this certificate on behalf of Contractor.

Contractor certifies that it has taken the following actions with respect to the construction Project that is the subject of the Contract:

1. Pursuant to Education Code §45125.2, Contractor has installed or will install, prior to commencement of Work, a physical barrier at the Work Site, which will limit contact between Contractor's employees and District pupils at all times (mandatory for all Projects); AND
2. The Contractor has complied with the fingerprinting requirements of Education Code §45125.1 with respect to all Contractor's employees and all of its subcontractors' employees who may have contact with District pupils in the course of providing services pursuant to the Contract, and the California Department of Justice has determined that none of those employees has been convicted of a felony, as that term is defined in Education Code §45122.1. A complete and accurate list of Contractor's employees and of all its subcontractors' employees who may

come in contact with District pupils during the course and scope of the Contract is attached hereto;
AND/OR

3. Pursuant to Education Code §45125.2, Contractor certifies that all employees will be under the continual supervision of, and monitored by, an employee of the Contractor who the California Department of Justice has ascertained has not been convicted of a violent or serious felony. The name and title of each employee who will be supervising Contractor's employees and its subcontractors' employees is:

Name: _____

Title: _____

AND/OR

4. The Work on the Contract is at an unoccupied school site and no employee and/or subcontractor or supplier of any tier of Contract shall come in contact with District pupils.

Contractor's responsibility for background clearance extends to all of its employees, Subcontractors, and employees of Subcontractors coming into contact with District pupils regardless of whether they are designated as employees or acting as independent contractors of the Contractor.

Date: _____

Proper Name of Contractor: _____

Signature: _____

By: _____

Its: _____

SECTION 00520

DISABLED VETERAN BUSINESS ENTERPRISE ("DVBE") PARTICIPATION GOAL

1. **DVBE Participation Policy.** The District is committed to achieving the legislatively and administratively established Participation Goal for Disabled Veteran Business Enterprises ("DVBEs") in accordance with California Education Code §17076.11. Through the DVBE participation program, the District encourages contractors to ensure maximum opportunities for the participation of DVBEs in the Work of the Contract.
2. **Definitions.**
 - 2.1 **Disabled Veteran.** A "Disabled Veteran" means a veteran of the military, naval, or air service of the United States with at least ten percent (10%) service-connected disability who is domiciled in the State of California.
 - 2.2 **Disabled Veteran Business Enterprise.** A "Disabled Veteran Business Enterprise" ("DVBE") means a business enterprise certified by the Office of Small and Minority Business, State of California, Department of General Services, pursuant to Military and Veterans Code §999, or an enterprise certifying that it is a DVBE by meeting all of the following requirements: (a) it is a sole proprietorship at least fifty-one percent (51%) owned by one or more Disabled Veterans, or in the case of a publicly owned business, at least fifty-one percent (51%) of its stock is owned by one or more Disabled Veterans; or a subsidiary wholly owned by a parent corporation, but only if at least fifty-one percent (51%) of the voting stock of the parent corporation is owned by one or more Disabled Veterans; or a joint venture in which at least fifty-one percent (51%) of the joint venture's management and control and earnings are held by one or more Disabled Veteran; (b) the management and control of the daily business operations are by one or more Disabled Veterans; provided that the Disabled Veteran(s) exercising management and control of the business enterprise are not required to be the same Disabled Veteran(s) who is/are the equity Owner(s) of the business enterprise; and (c) it is a sole proprietorship, corporation, or partnership with its home office located in the United States and which is not a branch or subsidiary of a foreign corporation, foreign firm, or other foreign-based business. The terms "foreign corporation" "foreign firm" and "foreign-based business" shall be deemed to mean a business entity that is incorporated or which has its principal headquarters located outside the United States of America.
3. **DVBE Participation Goal.** The term "Participation Goal" is a numerically expressed objective for DVBE participation in performing the Work of the Contract. The Participation Goal is not a quota, set-aside or rigid proportion. Through action of the District's Board of Education, the District has established a DVBE Participation Goal of **Three Percent (3%)** of the total Contract Amount.

4. Monitoring of DVBE Participation and Submission of Report.

- 4.1 **Certification of Participation.** At the time of execution of the contract, the Contractor will provide a statement to the District of anticipated participation of Disabled Veteran Business Enterprises in the contract.
- 4.2 **Submission of Report.** During performance of the Contract, Contractor shall monitor the Work of the Contract, award of subcontracts and contracts for materials, equipment and supplies for the purpose of determining DVBE participation in the Work of the Contract. Contractor shall report on a monthly basis all DVBE's utilized in the performance of the Work, the type or classification of the Work performed by each such DVBE and the dollar value of the Work performed by each such DVBE. In addition, upon completion of the Work of the Contract, Contractor shall submit a report to the District in the form attached hereto identifying all DVBEs utilized in the performance of the Work, the type or classification of the Work performed by each such DVBE and the dollar value of the Work performed by each such DVBE. The submission to the District of such report shall be deemed a condition precedent to the District's obligation to make payment of the Final Payment under the Contract Documents. The submission of such report shall be in addition to, and not in lieu of, any other conditions precedent set forth in the Contract Documents for the District's obligation to make payment of the Final Payment. The District reserves the right to request additional information or documentation from the Contractor evidencing efforts to comply with the DVBE Participation Goal.
- 4.3 **Contract Audit.** Contractor agrees that the District, or its designee, shall have the right to review, obtain and/or copy any and all writings, materials, documents and other records pertaining to the performance of the Contract. Contractor agrees that the District, or its designee, shall have access to any of Contractor's premises upon reasonable notice, during usual business hours for the purpose of interviewing employees and inspecting and/or copying such writings, materials, documents and other documents which may be relevant to a matter under investigation for the purpose of determining compliance with the DVBE Participation Goal.

**CERTIFICATION – PARTICIPATION OF
DISABLED VETERAN BUSINESS ENTERPRISES
IN ACCORDANCE WITH EDUCATION CODE 17076.11**

I certify that I have read the foregoing SECTION 00520 DISABLED VETERAN BUSINESS ENTERPRISE (“DVBE”) PARTICIPATION GOAL and will comply with the requirements as set forth in this contract.

Signature

Typed or Printed Name

Title

Company

Street Address

City, State, Zip

Telephone

Fax

E-mail

DVBE PARTICIPATION REPORT

Contractor Name: _____

Project Name: _____

Project Bid Number: _____

Date: _____

<i>Firm Name of DVBE</i>	<i>Trade/Portion of Work</i>	<i>Value of Work</i>

Does the cumulative dollar value of the foregoing DVBE participation meet or exceed three percent (3%) of the final Contract Amount, as adjusted by all change orders?

YES _____ NO _____

If your response is "NO", please attach to this Report a detailed description of the reasons for your failure to achieve the District's DVBE Participation Goal.

SECTION 00530

GUARANTEE

REEF SUNSET UNIFIED SCHOOL DISTRICT

_____ (Contractor's Name) hereby unconditionally guarantees that the work performed under and pursuant to District's Contract No. _____ for the Project known as **BID ## AVENAL E.S KINDERGARTEN PROJECT** ("Project") has been done in strict accordance with the requirements of the Contract and therefore further guarantees the work of the contract to be and remain free of defects in workmanship and materials for a period of one (1) year from the date of acceptance of the Project by the District's Board of Trustees, unless a longer guarantee period is called for by the Contract Documents, in which case the terms of the longer guarantee shall govern. The Contractor hereby agrees to repair or replace any and all work, together with any other work which may have been damaged or displaced in so doing, that may prove to be not in accordance with the requirements of the Contract or that may be defective in its workmanship or materials within the guarantee period specified, without any expense whatsoever to the District, ordinary wear and tear and unusual abuse and neglect only excepted. The Contractor has provided contract bonds which will remain in full force and effect during the guarantee period.

The Contractor further agrees that within ten (10) calendar days after being notified in writing by the District of any work not in accordance with the requirements of the contract or any defects in the work, he will commence and prosecute with due diligence all work necessary to fulfill the terms of this guarantee, and to complete the work within a reasonable period of time. In the event he fails to so comply, he does hereby authorize the District to proceed to have such work done at the Contractor's expense and he will pay the cost thereof upon demand. The District shall be entitled to all costs, including reasonable attorneys' fees, necessarily incurred upon the Contractor's refusal to pay the above costs.

Notwithstanding the foregoing paragraph, in the event of an emergency constituting an immediate hazard to the health or safety of the employees of the District, or its property or licensees, the District may undertake at the Contractor's expense without prior notice, all work necessary to correct such hazardous condition when it was caused by the work of the Contractor not being in accordance with the requirements of this contract, or being defective, and to charge the same to the Contractor as specified in the preceding paragraph.

The guarantee set forth herein is not intended by the parties, nor shall it be construed, as in any way limiting or reducing the District's rights to enforce all terms of the contract referenced hereinabove or the time for enforcement thereof. This guarantee is provided in addition to, and not in lieu of, the District's rights on such contract.

CONTRACTOR'S SIGNATURE

SUBCONTRACTOR'S SIGNATURE

Representative to be contacted for services:

Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

SECTION 00600

CONSTRUCTION FORMS

PART 1 – GENERAL

1.01 FORMS INCLUDED

- A. Request for Information (RFI)
- B. Field Clarification (FC)
- C. Substitution Request
- D. Change Order (CO)
- E. Daily Report
- F. Contractor Payment Request
- G. Final Inspection Certificate
- H. Construction Change Directive (CCD)

END OF SECTION



REQUEST FOR INFORMATION

Project: Avenal E.S Kindergarten Project

RFI No.: _____

Contractor:

BID NO.: ##

Owner: Reef Sunset Unified School District
205 N. Park Ave
Avenal, CA. 93204

Architect: A.P Architects
3434 Truxtun Avenue, Suite 240
Bakersfield, CA 93204

Drawing No.: _____ **Specification Section:** _____ **CONTRACT No.:** __ - __

<input type="checkbox"/> The information is requested for the following reason:			
<input type="checkbox"/> Direction not given in Contract Documents	<input type="checkbox"/> Specifications Reference		
<input type="checkbox"/> Interpretation of Contract Documents	<input type="checkbox"/> Shop Drawings Reference		
<input type="checkbox"/> Conflict in Contract / Contract Drawings	<input type="checkbox"/> Other		
INFORMATION REQUESTED:			
POSSIBLE COST IMPACT: YES NO		POSSIBLE TIME IMPACT: YES NO	
REPLY:			
POSSIBLE COST IMPACT: YES <input type="checkbox"/> NO <input type="checkbox"/>		POSSIBLE TIME IMPACT: YES <input type="checkbox"/> NO <input type="checkbox"/>	

Attachments:

Response:

By: _____

Date: _____

FIELD CLARIFICATION

TO CONTRACTOR: _____ FC No.: _____

FROM: _____ Date: _____

SCHOOL: _____ Project No.: _____

PROJECT: _____ Contract No.: _____

SUBJECT: _____

Reference: Drawings: _____ Specifications: _____

The following is issued as a clarification of the Contract Documents without any additional cost and/or time impact to the Contract:

List of Attachments: _____

Project Manager: _____ Date: _____

This document provides information or clarification only and does not constitute authorization or direction to proceed with additional work. If, in the opinion of the Contractor, the clarification has impact to the Contract amount and/or time, the Contractor must advise _____ in writing within five (5) days of receipt that the clarification constitutes issuance of a change order. The Contractor's notice shall be accompanied and appropriately supported with justification, reasoning and references where the contract requirements have been exceeded due to the clarification. Otherwise, this Field Clarification will stand as clarifications to the Contract Documents without any additional costs and/or time impact to the District.

B-1



SUBSTITUTION REQUEST

Project: Avenal E.S Kindergarten project

Contractor: SUB. REQ. NO.: _____

Owner: Reef Sunset unified School District
205 N. Park Ave,
Avenal, CA. 93204

Architect: A.P Architects.
3434 Truxtun Avenue, Suite 240
Bakersfield, CA 93204

Item: _____ **Specification Section:** _____

We hereby submit for your consideration the following product comparison of the specified item and the proposed substitution:

Comparison:	Specified Item:	Substitution:
1. Product Name/Model		
2. Manufacturer Information		
3. Product Cost		
4. Delivery Time		
5. Product Characteristics		
6. Dimensions/Effects		
7. Guarantee/Warranty		
8. ICBO No.		

9. UL Rating		
--------------	--	--

Architects:

- ☐ Approved
- ☐ Not Approved

By: _____

RSU.S.D:

- ☐ Approved
- ☐ Not Approved

By: _____



CHANGE ORDER

Date:

CHANGE ORDER NO. _____

PROJECT: Avenal E.S Kindergarten Project

RSU.S.D. BID No. ##
RSU.S.D. Agreement No.

OWNER: Reef Sunset USD
205 N. Park Ave
Avenal, CA. 93204

ARCHITECT A.P Architects
3434 Truxton Ave,
Avenal, CA 93204

CONTRACTOR:

Attn:

Architects Proj. No.:
D.S.A. File No.:
D.S.A. App. No.:

CONFORMANCE WITH CONTRACT DOCUMENTS, PROJECT MANUAL, DRAWINGS AND SPECIFICATION. All Change Order work shall be in strict conformance with the Contract Documents, Project Manual, Drawings, and Specifications as they pertain to work of a similar nature.

ORIGINAL CONTRACT SUM.....\$

NET CHANGE - ALL PREVIOUS CHANGE ORDERS.....\$

ADJUSTED CONTRACT SUM.....\$

NET CHANGE -.....\$

Total Change Orders to Date:.....\$

ADJUSTED CONTRACT SUM THROUGH CHANGE ORDER NO.....\$

Commencement Date:

Original Completion Date:

Original Contract Time:

Time Extension for all Previous Change Orders:

Time Extension for this Change Order:

Adjusted Completion Date:

Percentage

Item	Description	Unforeseen Condition (UFO)	Additional Scope (AS)	Design Clarification (DC)	Code Requirement
1.					
2.					
3.					
4.					
5.					
6.					
	Totals				

Total Change Order No \$

**NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND DEPT. SUPT. BUSINESS SERVICES OR PURCHASING DIRECTOR*

APPROVAL (REQUIRED):

ARCHITECT: _____

DATE: _____

CONTRACTOR: _____

DATE: _____

RECOMMENDED FOR APPROVAL:

RSUSD DSA INSPECTOR: _____

DATE: _____

DEPUTY SUPERINTENDENT BUSINESS AND FISCAL SERVICES:

DATE: _____

APPROVAL (REQUIRED):

BOARD APPROVAL

DATE: _____

DEPUTY. SUPT./PURCHASING DIRECTOR: _____

DATE: _____

DSA APPROVAL

DATE: _____

DAILY REPORT

School:	AVENALElementary School	Report No.:	
Project:	KINDERGARTEN PROJECT	Date:	Day:
Bid No.:	##	Architect	
Contractor:		Proj. No:	
		Average	
		Work Force:	

TEMPERATURE:	PRECIPITATION:	SKY:	WIND:

ACTIVITY:

EQUIPMENT:

<u>Description</u>	<u>Source</u>	<u>Units</u>	<u>Type</u>	<u>Work Area</u>

FIELD FORCE LABOR:

<u>Category</u>	<u>Source</u>	<u>Supv.</u>	<u>Frmn.</u>	<u>Jrny.</u>	<u>Appr.</u>	<u>Work Area</u>	<u>Remarks</u>
	TOTALS:						

Signed By: _____ **Date:** _____

Copies:	<input type="checkbox"/> Owner	<input type="checkbox"/> Contractor	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> File
----------------	--------------------------------	-------------------------------------	--------------------------------	--------------------------------	--------------------------------	-------------------------------

CONTRACTOR'S PAYMENT REQUEST

CONTRACTOR: _____ PAYMENT REQUEST No. _____

ADDRESS: _____

BID No.: **##** AGREEMENT No.: _____ SITE: **AVENAL E.S**

PROJECT: **AVENAL E.S Kindergarten Project** PURCHASE ORDER NO. _____

PERIOD ENDING: _____

- | | |
|---|--------------|
| 1. Original Agreement Amount | \$ _____ |
| 2. Net Change by Change Order Through C.O. # _____ | \$ _____ |
| 3. Revised Agreement Amount to Date (Lines 1 + 2) | \$ _____ |
| 4. Value of Work Completed to Date (per Schedule of Values) | \$ _____ |
| 5. Less 5 % Retention of Completed Work | < \$ _____ > |
| 6. Less prior Billings | < \$ _____ > |
| 7. CURRENT AMOUNT DUE THIS REQUEST | \$ _____ |
| 8. Adjustments/Withholdings | \$ _____ |
| 9. ADJUSTED TOTAL | \$ _____ |

CERTIFICATE OF THE CONTRACTOR: I hereby certify that the work performed and the materials supplied to date, as shown on the above, represents the actual value of accomplishment under the terms of the Contract (and all authorized changes thereto) between the undersigned and the Oxnard School District relating to the above-referenced project. I further certify that payments, less applicable retention, have been made through the period covered by previous payments received from the District, to (1) all my subcontractors (sub-contractors) and (2) for all materials and labor used in or in connection with the performance of this Contract. I further certify I have complied with Federal, State and Local tax laws, including Social Security laws and Unemployment Compensation laws and Workman's Compensation laws insofar as applicable to the performance of this Contract. I hereby certify that I have complied with all of the requirements of the Contract Documents including, but not limited to Section 6 and 60 of the General Conditions.

INDICATION OF PROJECT STATUS IS A NECESSARY CONDITION OF PAYMENT. INITIAL correct certification:
I hereby certify that we have completed _____ or have not completed _____ a sufficient portion of the work of this Contract to maintain our current completion schedule (contract plus change orders), have updated the "as built" drawings through the date of this payment request, and are familiar with the liquidated damages clause contained in this Contract. **(Please sign Request Form in any color ink other than black)**

1). Contractor:

By: _____

Date: _____

2). DSA Inspector:

By: _____

Date: _____

3). Project Manager:

By: _____

Date: _____

4). Architect:

By: _____

Date: _____

5). Deputy Superintendent, Business and Fiscal Services

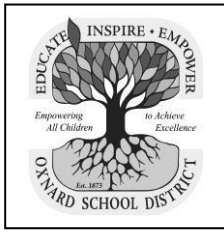
By: _____

Date: _____

6). Director of Purchasing:

By: _____

Date: _____



FINAL INSPECTION CERTIFICATE

Project: REEF SUNSET USD

Date of Issuance:

Owner: Reef Sunset unified School District
205 N. Park Ave,
Avenal, CA. 93204

Architect: A>P Architects
3434 Truxton Ave, Suite
240, AVENAL, CA 93204

Contractor:

O.S.D. Bid No.: ##
O.S.D. Agreement No.: ____-____
Architect's Project No.:

This is to certify that the work for Agreement No. ___, Avenal E.S Kindergarten Project Project, has been inspected by the General Contractor for compliance with the Contract Documents and by all public agencies having jurisdiction and that the work has been completed in accordance with the Contract Documents. The General Contractor also certifies that all equipment and systems have been tested in the presence of the District's Inspector of Record and other consultants, inspectors and governing agencies, and that all such equipment and systems are operational and ready for use.

The undersigned certifies that the work is fully complete and ready for final examination by the District.

General Contractor

By: _____

Title: _____



CONSTRUCTION CHANGE DIRECTIVE

DATE:

FILE No.:

CCD No.

DSA No.:

Project: AVENAL E.S Kindergarten Project
RSU.S.D. Bid No. ##

RSU.S.D. Agreement No:___-__

Contractor:

Owner: Reef Sunset Unified School District
3434 Truxtun Ave,
Bakersfield CA
93204

You are hereby directed to make change(s) in this Contract:

☐☐☐☐

1a. Lump Sum (increase) (decrease) of _____

1b. Unit Price of \$_____per lin.ft.

1c. Labor and Material, percentage of overhead and profit as provided in the Section 10 of the General Conditions.

1d. Other as follows:

2a. The Contract Time is proposed to be (increased) (decreased) by () days.

2b. The Contract Time is proposed to be Unchanged.

When signed by the Owner and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Directive and the Contractor shall proceed with the change(s) described above.

RECOMMENDED FOR APPROVAL

Architect

RECOMMENDED FOR APPROVAL:

O.S.D. Project Manager

BY:_____DATE:_____ BY:_____DATE:_____

Signature by the Contractor indicates the Contractor's agreement with the proposed adjustments in Contract Sum and Contract Time set forth in this Construction Change Directive and that contractor shall execute a change order consistent with this Construction Change Directive which change order shall be subject to approval by the District.

CONTRACTOR:

BY:_____DATE:_____

SECTION 00700

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GENERAL CONDITIONS

ARTICLE 1: DEFINITIONS; GENERAL

1.1 Architect. The Architect is the person or entity identified as such in the Agreement; references to the "Architect" includes the Architect's authorized representative and his, her or its successor(s).

1.2 Construction Equipment. "Construction Equipment" is equipment utilized for the performance of any portion of the Work, but which is not incorporated into the Work.

1.3 Contract Documents. The Contract Documents consist of the Agreement between the District and the Contractor, Conditions of the Contract (whether General, Special or otherwise), Drawings, Specifications, including addenda thereto issued prior to execution of the Agreement and any other documents listed in the Agreement. The Contract Documents shall include modifications issued after execution of the Agreement. The Contract Documents form the Contract for Construction.

1.4 Contract Document Terms. The term "provide" means "provide complete in place" or to "furnish and install" such item. Unless otherwise provided in the Contract Documents, the terms "approved;" "directed;" "satisfactory;" "accepted;" "acceptable;" "proper;" "required;" "necessary" and "equal" shall mean as approved, directed, satisfactory, accepted, acceptable, proper, required, necessary and equal, in the opinion of the District, its agents or representatives. The term "typical" as used in the Drawings shall require the installation or furnishing of such item(s) of the Work designated as "typical" in all other similar areas; Work in such other areas shall conform to that shown as "typical" or as reasonably inferable therefrom.

1.5 Contractor. The Contractor is the person or entity identified as such in the Agreement; references to "Contractor" include the Contractor's authorized representative.

1.6 Contractor's Superintendent. The Contractor's Superintendent is the individual employed by the Contractor whose principal responsibility shall be the supervision and coordination of the Work; the Contractor's Superintendent shall not perform routine construction labor.

1.7 Days. Unless otherwise expressly stated, references to "days" in the Contract Documents shall be deemed to be calendar days.

1.8 Deferred Approval Items. Deferred approval items are those items that shall not be started until detailed plans, specifications, and engineering calculations have been accepted and signed by the Architect or Engineer.

1.9 District. The "District" refers to **Reef Sunset Unified School District** and its authorized representatives, including the Project Manager, the District's Board of Trustees and the District's officers, employees, agents and representatives.

1.10 District's Inspector. The District's Inspector is the individual designated and employed by the District in accordance with the requirements of Title 24 of the California Code of Regulations.

The District's Inspector shall be authorized to act on behalf of the District as provided for in the Contract Documents and in Title 24 of the California Code of Regulations, as the same may be amended from time to time.

1.11 Division of State Architect ("DSA"). The DSA is the California Division of the State Architect including without limitation the DSA's Office of Construction Services, Office of Design Services and the Office of Regulation Services; references to the DSA in the Contract Documents shall mean the DSA, its offices and its authorized employees and agents. The authority of the DSA over the Work and the performance thereof shall be as set forth in the Contract Documents and Title 24 of the California Code of Regulations.

1.12 Drawings and Specifications. The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing generally, the design, location and dimensions of the Work and may include without limitation, plans, elevations, sections, details, schedules, notes or diagrams. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards, criteria and workmanship for the Work and related services. The Drawings and Specifications are intended to delineate and describe the Work and its component parts so as to permit skilled and competent contractors to bid upon the Work and prosecute the same to completion.

1.13 Intent and Correlation of Contract Documents.

1.13.1 Work of the Contract Documents. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary and what is required by one shall be as binding as if required by all. Performance by the Contractor shall be required to the extent consistent with the Contract Documents and reasonably inferable therefrom as being necessary to produce the intended results. Organization of the Specifications into divisions, sections or articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. Where any portion of the Contract Documents is silent and information appears elsewhere in the Contract Documents, such other portions of the Contract Documents shall control. Work not particularly detailed, marked or specified shall be the same as similar parts that are detailed, marked or specified.

1.13.2 Technical Terms. Unless otherwise stated in the Contract Documents, words or terms, which have, well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

1.13.3 Conflict in Contract Documents. The Contract Documents are intended to be fully cooperative and to agree. If Contractor observes any conflict, inconsistency or ambiguity, Contractor shall promptly notify the District and the Architect in writing of such conflict, inconsistency or ambiguity prior to commencement of affected Work. If a conflict, inconsistency or ambiguity arises, the following order or precedence shall generally apply, provided, however, that the order of precedence shall not be so rigidly interpreted as to create an absurd or costly result: Special Conditions shall take precedence over General Conditions, Specifications shall take precedence over

Drawings and shall govern as to materials, workmanship and installation procedures. Plans identify the scope and location of the Work. With regard to Drawings, larger details govern over smaller scale drawings, addenda and change order drawings govern over contract drawings, contract drawings govern over standard drawings.

1.14 Material Supplier. A Material Supplier is any person or entity who only furnishes materials, equipment or supplies for the Work without fabricating, installing or consuming them in the Work.

1.15 Project. The Project is the total construction of which the Work performed by the Contractor under the Contract Documents may be the whole or a part of the Project and which may include construction by the District or by separate contractors.

1.16 Project Manager. The Project Manager, if any, is the individual or entity designated as such in the Special Conditions. The Project Manager is an independent contractor retained by the District and shall be authorized and empowered to act on behalf of the District. The removal or replacement of the designated Project Manager shall not result in adjustment of the Contract Price or the Contract Time or otherwise affect, limit or restrict Contractor's obligations hereunder.

1.17 Record Documents. The Record Documents are a set of the Drawings and Specifications marked by the Contractor during the performance of the Work to indicate completely and accurately the actual as-built condition of the Work. The Record Documents shall be sufficient for a capable and qualified draftsman to modify the Drawings to reflect and indicate the Work actually in place at Final Completion of the Work.

1.18 Shop Drawings; Samples; Product Data ("Submittals"). Shop Drawings are diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor of any tier, manufacturer, Material Supplier, or distributor to illustrate some portion of the Work. Samples are physical examples of materials, equipment or workmanship forming a part of, or to be incorporated into the Work. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work. Shop Drawings, Samples and Product Data prepared or furnished by the Contractor or any of its Subcontractors or Material Suppliers are collectively referred to as "Submittals".

1.19 Site. The Site is the physical area designated in the Contract Documents for Contractor's performance, construction and installation of the Work.

1.20 Subcontractors; Sub-Subcontractors. A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work. "Subcontractor" does not include a separate contractor to the District or subcontractors of any separate contractor. A Sub-Subcontractor is a person or entity of any tier, who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site.

1.21 Special Conditions. If made a part of the Contract Documents, Special Conditions are special or supplemental provisions, not otherwise provided for in the Agreement or the General Conditions.

1.22 Surety. The Surety is the person or entity that executes, as surety, the Contractor's Labor and

Material Payment Bond and/or Performance Bond or other bonds provided by the Contractor.

1.23 Work. The "Work" is the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment or services provided or to be provided by the Contractor to fulfill the Contractor's obligations under the Contract Documents. The Work may constitute the whole or a part of the Project.

ARTICLE 2: DISTRICT

2.1 Information Required of District.

2.1.1 Surveys; Site Information. District may provide information concerning physical characteristics of the Site. Information not provided by the District concerning physical characteristics of the Site, which is required, shall be obtained by Contractor without adjustment to the Contract Price or the Contract Time.

2.1.2 Drawings and Specifications. All of the Drawings and the Specifications shall remain the property of the District; the Contractor shall not use the Drawings or the Specifications in connection with any other work of improvement other than the Work of the Project.

2.1.3 Furnishing of Information. Information or services to be provided by the District under the Contract Documents shall be furnished by the District with reasonable promptness to avoid delay in the orderly progress of the Work. Information about existing conditions furnished by the District under the Contract Documents is obtained from sources believed to be reliable, but the District neither guarantees nor warrants that such information is complete and accurate. The Contractor shall verify all information provided by the District. To the extent that the Contract Documents depict existing conditions on or about the Site, or the Work involves the renovation, removal or remodeling of existing improvements, or the Work involves any tie-in or other connection with any existing improvements, the conditions and/or existing improvements depicted in the Contract Documents are as they are believed to exist.

2.2 District's Right to Stop the Work. In addition to the District's right to suspend the Work or terminate the Contract pursuant to the Contract Documents, the District may, by written order, direct the Contractor to stop the Work, or any portion thereof, until the cause for such stop work order has been eliminated, if the Contractor: (i) fails to correct Work which is not in conformity and in accordance with the requirements of the Contract Documents, or (ii) otherwise fails to carry out the Work in conformity and accordance with the Contract Documents. The right of the District to stop the Work hereunder shall not be deemed a duty on the part of the District to exercise such right for the benefit of the Contractor or any other person or entity, nor shall the District's exercise of such right waive or limit the exercise of any other right or remedy of the District under the Contract Documents or at law.

2.3 Partial Occupancy or Use.

231 District's Right to Partial Occupancy. The District may occupy or use any completed or partially completed portion of the Work, provided that the District and the Contractor have accepted, in writing, the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, utilities, damage to the Work, insurance and the period for correction of the Work and commencement of warranties required by the Contract Documents for such portion of the Work partially used or occupied by the District. If the Contractor and the District are unable to agree upon the matters set forth above, the District may nevertheless use or occupy any portion of the Work, with the responsibility for such matters subject to resolution in accordance with the Contract Documents. Immediately prior to such partial occupancy or use of the Work, or portions thereof, the District, the District's Inspector, the Contractor and the Architect shall jointly inspect the portions of the Work to be occupied or to be used to determine and record the condition of the Work. The District's use or occupancy of the Work or portions thereof pursuant to the preceding shall not be deemed "completion" of the Work as that term is used in Public Contract Code §7107.

232 No Acceptance of Defective or Nonconforming Work. Unless otherwise expressly agreed upon by the District and the Contractor, the District's partial occupancy or use of the Work or any portion thereof, shall not constitute the District's acceptance of the Work not complying with the requirements of the Contract Documents or which is otherwise defective.

2.4 The District's Inspector. In addition to the authority and rights of the District's Inspector as provided for elsewhere in the Contract Documents, all of the Work shall be performed under the observation of the District's Inspector in accordance with the provisions of Title 24 of the California Code of Regulations. The District's Inspector shall have access to all parts of the Work at any time, wherever located, including shop inspections, and whether partially or completely fabricated, manufactured, furnished or installed. The performance of the duties of the District's Inspector under the Contract Documents shall not relieve or limit the Contractor's performance of its obligations under the Contract Documents.

ARTICLE 3: ARCHITECT

3.1 Architect's Administration of the Contract.

311 Administration of Contract. The Architect will provide administration of the Contract as described in the Contract Documents, and will be one of the District's representatives during construction until the time that Final Payment is due the Contractor. The Architect will advise and consult with the District, the Project Manager and the District's Inspector with respect to the administration of the Contract and the Work. The Architect shall have the responsibilities and powers established by law, including Title 24 of the California Code of Regulations.

312 Periodic Site Observations. The Architect will visit the Site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the

completed Work and to determine, in general, if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the Contract Documents. The Architect will not be required to make exhaustive or continuous Site observations to check quality or quantity of the Work. On the basis of Site observations as an architect, the Architect will keep the District informed of the progress of the Work, and will endeavor to guard the District against defects and deficiencies in the Work.

313 Contractor Responsibility for Construction Means, Methods and Sequences.

The Architect will not have control over or charge of and will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, these being solely the Contractor's responsibility. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or of any other persons performing portions of the Work.

314 Verification of Applications for Payment. In accordance with Article 8 hereof, the Architect will review the Contractor's Applications for Progress Payments and for Final Payment, verify the extent of Work performed and the amount properly due the Contractor on such Application for Payment.

315 Rejection of Work. The Architect is authorized to reject Work which is defective or does not conform to the requirements of the Contract Documents. Whenever the Architect considers it necessary or advisable, additional inspections or testing of the Work may be conducted, whether or not such Work is fabricated, installed or completed. Neither this authority of the Architect nor a decision made in good faith by the Architect to exercise or not to exercise such authority shall give rise to a duty or responsibility to the Contractor, Subcontractors, Material Suppliers, their agents or employees, or other persons performing portions of the Work.

316 Architect's Review of Submittals. The Architect will review and approve or take other appropriate action upon the Contractor's Submittals, but only for the limited purpose of checking for conformance with the design concept expressed in the Contract Documents. Review of Submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's Submittals shall not relieve the Contractor of its obligations under the Contract Documents. The Architect's review of Submittals shall not constitute approval of safety measures, programs or precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item in a Submittal shall not indicate approval of an assembly of which the item is a component. The Architect's review and return of Submittals will normally require a minimum of fourteen (14) days from date of receipt of complete submittal. Deferred approval submittals indicated in the Contract Documents require additional time for processing and review of all submittals.

317 Changes to the Work; Change Orders. The Architect will prepare Change Orders and may authorize minor changes in the Work in accordance with Article 9.9 hereof.

318 Completion. The Architect will conduct observations to determine the date(s) of interim milestones, if any, and the dates of Substantial and Final Completion. The Architect will verify that the Contractor has complied with all requirements of the Contract Documents and is entitled to receipt of Final Payment.

319 Interpretation of Contract Documents. The Architect will interpret and decide matters concerning the requirements of the Contract Documents on written request of either the District or the Contractor, or as deemed necessary. The Architect's response to such requests will be made in writing with reasonable promptness and within the time limits specified in the Contract Documents. Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings with transmittal letter. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both the District and the Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith. The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

ARTICLE 4: THE CONTRACTOR

41 Communications. All communications regarding the Work, the performance thereof or the Contract Documents shall be in writing; oral communications, unless reduced to writing, are not binding on the parties. Communications between the Contractor and the District shall be through the Project Manager. Communications between separate contractors, if any, shall be through the Project Manager. Contractor shall make all written communications concerning the Project available to the District upon request.

42 Contractor Review of Contract Documents.

421 Examination of Contract Documents. The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the District pursuant to the Contract Documents and shall at once report to the District any errors, inconsistencies or omissions discovered. If the Contractor performs any Work knowing, or with reasonable diligence should have known that, it involves an error, inconsistency or omission in the Contract Documents without prior written notice to the District of the same, the Contractor shall assume full responsibility for such performance and shall bear all attributable costs for correction of the same.

422 Field Measurements. Prior to commencement of the Work, or portions thereof, the Contractor shall take field measurements and verify field conditions at the Site and shall

carefully compare such field measurements and conditions and other information known to the Contractor with information provided in the Contract Documents. Errors, inconsistencies or omissions discovered shall be reported to the District at once.

423 Dimensions; Layouts and Field Engineering. Dimensions indicated in the Drawings are intended for reference only. The Contractor shall be solely responsible for dimensioning and coordinating the Work of the Contract Documents. All field engineering required for laying out the Work and/or establishing grades for earthwork operations shall be by the Contractor at its expense. Any field engineering or other engineering to be provided or performed by the Contractor under the Contract Documents and required or necessary for the proper execution or installation of the Work shall be provided and performed by an engineer duly registered under the laws of the State of California in the engineering discipline for such portion of the Work.

424 Request for Information. If the Contractor encounters any condition which the Contractor believes, in good faith and with reasonable basis, is the result of an ambiguity, conflict, error or omission in the Contract Documents (collectively “the Conditions”), it shall be the affirmative obligation of the Contractor to timely notify the District, in writing, of the Conditions encountered and to request information from the District necessary to address and resolve any such Conditions before proceeding with any portion of the Work affected or which may be affected by such Conditions. If the Contractor fails to timely notify the District in writing of any Conditions encountered and the Contractor proceeds to perform any portion of the Work containing or affected by such Conditions, the Contractor shall bear all costs associated with or required to correct, remove, or otherwise remedy any portion of the Work affected thereby without adjustment of the Contract Time or the Contract Price. In requesting information of the Architect to address and resolve any Conditions, the Contractor shall act with promptness in submitting any such written request so as to allow the Architect a reasonable period of time to review, evaluate and respond to any such request, taking into account the then current status of the progress and completion of the Work and the actual or potential impact of any such Conditions upon the completion of the Work within the Contract Time. The Contract Time shall not be subject to adjustment in the event that the Contractor shall fail to timely request information from the Architect. The Architect's responses to any such Contractor request for information shall conform to the standards and time frame set forth in Article 3.1.9 of these General Conditions. The foregoing provisions notwithstanding, in the event that the Architect reasonably determines that any of Contractor's request(s) for information: (i) does not reflect adequate or competent supervision or coordination by the Contractor or any Subcontractor; or (ii) does not reflect the Contractor's adequate or competent knowledge of the requirements of the Work or the Contract Documents; or (iii) is not justified for any other reason, Contractor shall be liable to the District for all costs incurred by the District associated with the processing, reviewing, evaluating and responding to any such request for information, including without limitation, fees of the Architect and any other design consultant to the Architect or the District. In the event that the Architect makes such a determination, the District may deduct such costs from

any portion of the Contract Price then or thereafter due the Contractor.

425 Work in Accordance With Contract Documents. The Contractor shall perform all of the Work in strict conformity with the Contract Documents and approved Submittals.

43 Site Investigation; Subsurface Conditions.

431 Contractor Investigation. The Contractor shall be responsible for, and by executing the Agreement acknowledges, that it has carefully examined the Site and has taken all steps it deems reasonably necessary to ascertain all conditions which may affect the Work, or the cost thereof, including, without limitation, conditions bearing upon transportation, disposal, handling or storage of materials; availability of labor or utilities; access to the Site; and the physical conditions and the character of equipment, materials, labor and services necessary to perform the Work. Any failure of the Contractor to do so will not relieve it from the responsibility for fully and completely performing all Work without adjustment to the Contract Price or the Contract Time. The District assumes no responsibility to the Contractor for any understandings or representations concerning conditions or characteristics of the Site, or the Work, made by any of its officers, employees or agents prior to the execution of the Agreement, unless such understandings or representations are expressly set forth in the Agreement.

432 Subsurface Data. By executing the Agreement, the Contractor acknowledges that it has examined the subsurface data available and satisfied itself as to the character, quality and quantity of surface and subsurface materials, including without limitation, obstacles which may be encountered in performance of the Work, insofar as this information is reasonably ascertainable from an inspection of the Site, review of available subsurface data and analysis of information furnished by the District under the Contract Documents. Subsurface data or other soils investigation report provided by the District hereunder are not a part of the Contract Documents. Information contained in such data or report regarding subsurface conditions, elevations of existing grades, or below grade elevations are approximate only and is neither guaranteed nor warranted by the District to be complete and accurate. The Contractor shall examine all subsurface data to make its own independent interpretation of the subsurface conditions and acknowledges that its bid is based upon its own opinion of the conditions which may be encountered. The District assumes no responsibility for any conclusions or interpretations made by Contractor on the basis of available subsurface data or other information furnished by District under the Contract Documents.

433 Subsurface Conditions.

433.1 Procedures. If the Work under the Contract Documents involves digging trenches or other excavations that extend deeper than four feet below the surface, the Contractor shall promptly and before the following conditions are disturbed, notify the District's Inspector, in writing, of any: (i) material that the Contractor believes may be

material that is hazardous waste, as defined in California Health and Safety Code §25117, that is required to be removed to a Class I or Class II or Class III disposal site in accordance with provisions of existing law; (ii) subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to Contractor prior to award of the Contract; or (iii) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in the Work or the character provided for in the Contract Documents. If upon notice to the District of the conditions described above and upon the District's investigation thereof, the District determines that the conditions so materially differ or involve such hazardous materials which require an adjustment to the Contract Price or the Contract Time, the District shall issue a Change Order in accordance with Article 9 hereof. In accordance with California Public Contract Code §7104, any dispute arising between the Contractor and the District as to any of the conditions listed in (i), (ii) or (iii) above, shall not excuse the Contractor from the completion of the Work within the Contract Time and the Contractor shall proceed with all Work to be performed under the Contract Documents. The District reserves the right to terminate the Contract pursuant to Article 15.2 hereof should the District determine not to proceed because of any condition described in (i), (ii) or (iii) above.

4.3.3.2 Trenching. For all excavations in excess of five (5) feet involving an estimated expenditure in excess of \$25,000, Contractor shall submit to the District for acceptance a detailed Drawing showing the design of shoring, bracing, sloping or other provisions to be made for the protection of workmen from the hazard of caving ground. If such design varies from the standards established by the Construction Safety Orders of the California Division of Industrial Safety, the Drawing shall be prepared by a registered civil or structural engineer. None of the aforementioned trenching shall be started before Contractor receives notification of acceptance from the District. Contractor shall comply with all other applicable requirements of California Labor Code §6705, and as therein provided, no provisions of that Section or this Section shall be construed to impose tort liability upon the District. In any event, Contractor shall not commence any excavation work until it has secured all necessary permits including the required CAL OSHA excavation/shoring permit. Any permits shall be prominently displayed on the Project premises prior to commencement of any excavation.

44 Supervision and Construction Procedures.

441 Supervision of the Work. The Contractor shall supervise and direct performance of the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract Documents, unless Contract Documents give other specific instructions concerning these matters. The Contractor shall be responsible for inspection of completed or partially completed portions of Work to determine that such portions are in proper condition to receive subsequent Work.

442 Responsibility for the Work; Coordination of the Work. The Contractor shall be responsible to the District for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and all other persons performing any portion of the Work under a contract with the Contractor. The Contractor shall not be relieved of the obligation to perform the Work in accordance with the Contract Documents either by activities or duties of the Project Manager, District's Inspector or the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor. The Contractor shall be responsible for all necessary or appropriate coordination of the Work and component parts thereof so that Final Completion of the Work will be achieved within the Contract Time and the Work will be completed for the Contract Price. The coordination of the Work is a material obligation of the Contractor hereunder and shall include without limitation, conducting regular coordination meetings with its Subcontractors and Material Suppliers, sequencing the operations of Subcontractors and Material Suppliers, and adapting its planned means, methods and sequences of construction operations as necessary to accommodate field or changed conditions at the Site.

443 Surveys. The Contractor shall prepare or cause to be prepared all detailed surveys necessary for performance of the Work. The Contractor shall be responsible for the establishment, location, maintenance and preservation of benchmarks, reference points and stakes for the Work, the cost of which shall be included within the Contract Price. The Contractor shall be solely responsible for all loss or costs resulting from the loss, destruction, disturbance or damage of benchmarks, reference points or stakes.

444 Construction Utilities. The Contractor shall arrange for the furnishing of and shall pay the costs of all utility services, including, without limitation, electricity, water, gas and telephone necessary for performance of the Work and the Contractor's obligations under the Contract Documents. The Contractor shall furnish and install necessary or appropriate temporary distributions of utilities, including meters, to the Site. Any such temporary distributions shall be removed by the Contractor upon completion of the Work. The costs of all such utility services, including the installation and removal of temporary distributions thereof, shall be borne by the Contractor and included in the Contract Price.

445 Existing Utilities; Removal, Relocation and Protection. In accordance with California Government Code §4215, the District shall assume the responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Site which are not identified in the Drawings, Specifications or other Contract Documents. Contractor shall be compensated for the costs of locating, repairing damage not due to the Contractor's failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Drawings, Specifications and other Contract Documents with reasonable accuracy, and for equipment on the Site necessarily idled during such work. Contractor shall not be assessed Liquidated Damages for delay in completion of the Work

when such delay is caused by the failure of the District or the utility district to provide for removal or relocation of such utility facilities. Nothing in this Article 4.4.5 shall be deemed to require the District to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, meters and junction boxes, on or adjacent to the Site. If the Contractor encounters utility facilities not identified by the District in the Drawings, Specifications, or other Contract Documents, the Contractor shall immediately notify, in writing, the District and the utility owner. In the event that such utility facilities are owned by a public utility, the public utility shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a price determined in accordance with Article 9 of these General Conditions.

45 Labor and Materials.

451 Payment for Labor, Materials and Services. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, applicable taxes, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated in the Work.

452 Employee Discipline and Skills. The Contractor shall enforce strict discipline and good order among the Contractor's employees, the employees of any Subcontractor of any tier, and all other persons performing any part of the Work at the Site. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. The Contractor shall dismiss from its project employees and direct any Subcontractor of any tier to dismiss from their employment on the project any person deemed by the District to be unfit or incompetent to perform Work and thereafter, the Contractor shall not employ nor permit the employment of such person for performance of any part of the Work without the prior written consent of the District, which consent may be withheld in the reasonable discretion of the District.

453 Contractor's Superintendent and Project Manager. The Contractor shall employ a competent superintendent, project manager and all necessary assistants who shall be in attendance at the Site at all times during performance of the Work. The Contractor's communications relating to the Work or the Contract Documents shall be through the Contractor's superintendent and/or project manager. The superintendent shall represent the Contractor at the Site and communications given to the superintendent shall be binding as if given to the Contractor. The Contractor shall dismiss from the project the superintendent, project manager or any of his/her assistants if they are deemed, in the sole reasonable judgment of the District, to be unfit, incompetent or incapable of performing the functions assigned to them. In such event, the District shall have the right to approve of the replacement superintendent, project manager or assistant.

454 Prohibition on Harassment.

4.5.4.1 District's Policy Prohibiting Harassment. The District is committed to providing a campus and workplace free of sexual harassment and harassment based on factors such as race, color religion, national origin, ancestry, age, medical condition, marital status, disability or veteran status. Harassment includes without limitation, verbal, physical or visual conduct which creates an intimidating, offensive or hostile environment such as racial slurs; ethnic jokes; posting of offensive statements, posters or cartoons or similar conduct. Sexual harassment includes without limitation the solicitation of sexual favors, unwelcome sexual advances, or other verbal, visual or physical conduct of a sexual nature.

4.5.4.2 Contractor's Adoption of Anti-Harassment Policy. Contractor shall adopt and implement all appropriate and necessary policies prohibiting any form of discrimination in the workplace, including without limitation harassment on the basis of any classification protected under local, state or federal law, regulation or policy. Contractor shall take all reasonable steps to prevent harassment from occurring, including without limitation affirmatively raising the subject of harassment among its employees, expressing strong disapproval of any form of harassment, developing appropriate sanctions, informing employees of their right to raise and how to raise the issue of harassment and informing complainants of the outcome of an investigation into a harassment claim. Contractor shall require that any Subcontractor or Sub-subcontractor performing any portion of the Work to adopt and implement policies in conformity with this Article 4.5.4.

4.5.4.3 Prohibition on Harassment at the Site. Contractor shall not permit any person, whether employed by Contractor, a Subcontractor, Sub-subcontractor, or any other person or entity, performing any Work at or about the Site to engage in any prohibited form of harassment. Any such person engaging in a prohibited form of harassment directed to any individual performing or providing any portion of the Work at or about the Site shall be subject to appropriate sanctions in accordance with the anti-harassment policy adopted and implemented pursuant to Article 4.5.4.2 above. Any person performing or providing Work on or about the Site who engages in a prohibited form of harassment directed to any student, faculty member or staff of the District or directed to any other person on or about the Site shall be subject to immediate removal and shall be prohibited thereafter from providing or performing any portion of the Work. Upon the District's receipt of any notice or complaint that any person employed directly or indirectly by Contractor in performing or providing the Work has engaged in a prohibited form of harassment, the District will promptly undertake an investigation of such notice or complaint. In the event that the District, after such investigation, reasonably determines that a prohibited form of harassment has occurred, the District shall promptly notify the Contractor of the same and direct that the person engaging in such conduct be immediately removed from the Site. Unless the District's determination

that a prohibited form of harassment has occurred is grossly negligent or without reasonable cause, the District shall have no liability for directing the removal of any person determined to have engaged in a prohibited form of harassment nor shall the Contract Price or the Contract Time be adjusted on account thereof. Contractor and the Surety shall defend, indemnify and hold harmless the District and its employees, officers, Board of Trustees, agents, and representatives from any and all claims, liabilities, judgments, awards, actions or causes of actions, including without limitation, attorneys' fees, which arise out of, or pertain in any manner to: (i) the assertion by any person dismissed from performing or providing work at the direction of the District pursuant to this Article 4.5.4.3; or (ii) the assertion by any person that any person directly or indirectly under the employment or direction of the Contractor has engaged in a prohibited form of harassment directed to or affecting such person. The obligations of the Contractor and the Surety under the preceding sentence are in addition to, and not in lieu of, any other obligation of defense, indemnity and hold harmless whether arising under the Contract Documents, at law or otherwise; these obligations survive completion of the Work or the termination of the Contract.

46 Taxes. The Contractor shall pay, without adjustment of the Contract Price, all sales, consumer, use and other taxes for the Work or portions thereof provided by the Contractor under the Contract Documents.

47 Permits, Fees and Notices; Compliance with Laws.

471 Payment of Permits, Fees. Unless otherwise provided in the Contract Documents, the Contractor shall secure, pay for, and include in the Contract Price the building permits, other permits, governmental fees, licenses and inspections necessary or required for the proper execution and completion of the Work.

472 Compliance with Laws. The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and other orders of public authorities bearing on performance of the Work.

473 Notice of Variation from Laws. If the Contractor knows, or has reason to believe, that any portion of the Contract Documents are at variance with applicable laws, statutes, ordinances, building codes, regulations or rules, the Contractor shall promptly notify the District, in writing, of the same. If the Contractor performs Work knowing, or with reasonable diligence should have known, it to be contrary to laws, statutes, ordinances, building codes, rules or regulations applicable to the Work without such notice to the District, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs arising or associated therefrom, including without limitation, the removal, replacement or correction of the same.

48 Submittals.

481 Purpose of Submittals. Shop Drawings, Product Data, Samples and similar submittals (collectively “Submittals”) are not Contract Documents. The purpose for submission of Submittals is to demonstrate, for those portions of the Work for which Submittals are required, the manner in which the Contractor proposes to provide or incorporate such item of the Work in conformity with the information given and the design concept expressed in the Contract Documents.

482 Contractor's Submittals.

4.8.2.1 Prompt Submittals. The Contractor shall review, confirm and submit to the Architect with the number of copies of Submittals within the timeframes required by the Contract Documents. Contractor’s submission of Submittals in conformity with the Submittal Schedule is a material consideration of the Contract. In the event that the District reasonably determines that all or any portion of any Submittal fails to comply with the requirements of the Contract Documents and/or such Submittals are not otherwise complete and accurate so as to require re-submission more than one (1) time, Contractor shall bear all costs associated with the review and approval of such resubmitted Submittals; provided that such costs are in addition to, and not in lieu of, any liquidated damages imposed under the Contract Documents for Contractor's delayed submission of Submittals. Submittals not required by the Contract Documents may be returned without action. No adjustment to the Contract Time or the Contract Price shall be granted to the Contractor on account of its failure to make timely submission of any Submittals.

4.8.2.2 Approval of Contractor’s Confirmation of Submittals. All Submittals prepared by Subcontractors, of any tier, Material Suppliers, manufacturers or distributors shall bear the written approval of the Contractor thereto prior to submission to the Architect for review. Any Submittal not bearing the Contractor's written approval shall be subject to return to the Contractor for re-submittal in conformity herewith, with the same being deemed to not have been submitted. Any delay, impact or cost associated therewith shall be the sole and exclusive responsibility of the Contractor without adjustment of the Contract Time or the Contract Price.

4.8.2.3 Verification of Submittal Information. By approving and submitting Submittals, the Contractor represents to the District and Architect that the Contractor has determined and verified materials, field measurements, field construction criteria, catalog numbers and similar data related thereto and has checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents.

4.8.2.4 Information Included in Submittals. All Submittals shall be accompanied by a written transmittal or other writing by the Contractor providing an identification of

the portion of the Drawings or the Specifications pertaining to the Submittal, with each Submittal numbered consecutively for ease of reference along with the following information: (i) date of submission; (ii) project name; (iii) name of submitting Subcontractor; and (iv) if applicable, the revision number. The foregoing information is in addition to, and not in lieu of, any other information required for the Architect's review, evaluation and approval of the Contractor's Submittals.

4.8.2.5 Contractor Responsibility for Deviations. The Contractor shall not be relieved of responsibility for correcting deviations from the requirements of the Contract Documents by the Architect's approval of Submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission of the Submittal and the District has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the Architect's approval thereof.

4.8.2.6 No Performance of Work without Approval. The Contractor shall perform no portion of the Work requiring the Architect's review and approval of Submittals until the Architect has completed its review and granted its approval of such Submittal. The Contractor shall not perform any portion of the Work forming a part of a Submittal or which is affected by a related Submittal until the entirety of the Submittal or other related Submittal has been fully approved.

483 Architect Review of Submittals. The purpose of the Architect's review of Submittals and the time for the Architect's return of Submittals to the Contractor shall be as set forth elsewhere in the Contract Documents, including without limitation, Article 3.1.6 of the General Conditions. If the Architect returns a Submittal as rejected or requiring correction(s) and re-submission, the Contractor, so as not to delay the progress of the Work, shall promptly thereafter resubmit a Submittal conforming to the requirements of the Contract Documents; the resubmitted Submittal shall indicate the portions thereof modified in order to obtain the Architect's approval. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Architect shall be entitled to rely upon the accuracy and completeness of such calculations and certifications accompanying Submittals. The Architect's review of the Submittals is for the limited purposes described in the Contract Documents.

484 Deferred Approval Items. In the event that any portion of the Work is designated in the Contract Documents as a "Deferred Approval" item, Contractor shall be solely and exclusively responsible for the preparation of Submittals for such item(s) in a timely manner so as not to delay or hinder the completion of the Work within the Contract Time.

49 Materials and Equipment.

491 Specified Materials, Equipment. Except as otherwise provided, references in the

Contract Documents to any specific article, device, equipment, product, material, fixture, patented process, form, method or type of construction, by name, make, trade name, or catalog number, with or without the words "or equal" shall be deemed to establish a minimum standard of quality or performance, and shall not be construed as limiting competition.

492 Approval of Or Equal, Substitutions or Alternatives. The Contractor may propose to furnish alternatives or substitutes for a particular item specified in the Contract Documents, provided that the Contractor provides advance written notice to the District of such proposed or equal, substitution or alternative and certifies to the District that the quality, performance capability, functionality and appearance of the proposed alternative or substitute will meet or exceed the quality, performance capability, functionality, and appearance of the item or process specified, and must demonstrate to the District that the use of the substitution or alternative is appropriate and will not delay completion of the Work or result in an increase to the Contract Price. The Contractor shall submit all data to the District to permit the Architect's proper evaluation of the proposed substitution or alternative. The Contractor shall not provide, furnish or install any substitution or alternative without the District's prior approval of the same; any alternative or substitution installed or incorporated into the Work without first obtaining the District's approval of the same shall be subject to removal pursuant to Article 12 hereof. The District's decision shall be final regarding the approval or disapproval of the Contractor's proposed substitutions or alternatives. The District's approval of any Contractor-proposed substitution shall be in accordance with Change Order procedures set forth in Article 9 and as otherwise specified in the Contract Documents.

493 Placement of Material and Equipment Orders. Contractor shall, after award of the Contract, promptly and timely place all orders for materials and/or equipment necessary for completion of the Work so that delivery of the same shall be made without delay or interruption to the timely completion of the Work. Contractor shall require that any Subcontractor of any tier performing any portion of the Work similarly place orders for all materials and/or equipment to be furnished by any such Subcontractor. Upon request of the District, the Contractor shall furnish reasonably satisfactory written evidence of the placement of orders for materials and/or equipment necessary for completion of the Work, including without limitation, orders for materials and/or equipment to be provided, furnished or installed by any Subcontractor of any tier.

494 District's Right to Place Orders for Materials and/or Equipment. If the Contractor fails or refuses to provide reasonably satisfactory written evidence of the placement of orders for materials and/or equipment necessary for completion of the Work, or should the District determine, in its sole and reasonable discretion, that such orders have not been placed in a manner that assures timely delivery of such materials and/or equipment to the Site so the Work can be completed without delay or interruption, the District shall have the right, but not the obligation, to place such orders on behalf of the Contractor. If the District exercises such right, the District's conduct in that regard does not assume control of

the work. Rather, Contractor remains responsible for the means, methods, techniques, sequences or procedures for completion of the Work and is not relieved from any of Contractor's obligations under the Contract Documents, including without limitation, completion of the Work within the Contract Time and for the Contract Price. If the District exercises the right hereunder to place orders for materials and/or equipment on behalf of Contractor pursuant to the foregoing, Contractor shall reimburse the District for all costs and fees incurred by the District in placing such orders; such costs and fees may be deducted by the District from the Contract Price then or thereafter due the Contractor.

410 Safety.

4101 Safety Programs. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety programs required by applicable law, ordinance, regulation or governmental orders in connection with the performance of the Contract, or otherwise required by the type or nature of the Work. The Contractor shall require that its Subcontractors similarly initiate and maintain all appropriate or required safety programs.

4102 Safety Precautions. The Contractor shall be solely responsible for initiating and maintaining reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to: (i) employees on the Work and other persons who may be affected thereby; (ii) the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors of any tier; and (iii) other property or items at the site of the Work, or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities whether or not designated for removal, relocation or replacement in the course of construction. The Contractor shall erect and maintain, as required by existing conditions and conditions resulting from performance of the Contract, reasonable safeguards for safety and protection of property and persons, including, without limitation, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying Districts and users of adjacent sites and utilities. The Contractor shall give or post all notices required by applicable law and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

4103 Safety Coordinator. The Contractor shall designate a responsible member of the Contractor's organization at the Site whose duty shall be the prevention of accidents and the implementation and maintenance safety precautions and programs. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the District.

4104 Emergencies. In an emergency affecting safety of persons or property, the Contractor shall act, to prevent threatened damage, injury or loss.

411 Hazardous Materials.

411.1 Use of Hazardous Materials. In the event that the Contractor, any Subcontractor or anyone employed directly or indirectly by them shall use, at the Site, or incorporate into the Work, any material or substance deemed to be hazardous or toxic under any law, rule, ordinance, regulation or interpretation thereof (collectively "Hazardous Materials"), the Contractor shall comply with all laws, rules, ordinances or regulations applicable thereto and shall exercise all necessary safety precautions relating to the use, storage or disposal thereof. Unless otherwise provided, Contractor shall be solely responsible for the transportation and disposal of any Hazardous Materials on or about the Site.

411.2 Prohibition on Use of Asbestos Containing Building Materials ("ACBMs"). Notwithstanding any provision of the Drawings or the Specifications to the contrary, it is the intent of the District that ACBMs not be used or incorporated into any portion of the Work. If any portion of the Work depicted in the Drawings or the Specifications shall require materials or products which the Contractor knows, or should have known with reasonably diligent investigation, to contain ACBMs, Contractor shall promptly notify the District of the same so that an appropriate alternative can be made in a timely manner so as not to delay the progress of the Work. Contractor warrants to the District that there are no materials or products used or incorporated into the Work which contain ACBMs. Whether before or after completion of the Work, if it is discovered that any product or material forming a part of the Work or incorporated into the Work contains ACBMs, the Contractor shall at its sole cost and expense remove such product or material in accordance with any laws, rules, procedures and regulations applicable to the handling, removal and disposal of ACBMs and to replace such product or material with non-ACBM products or materials and to return the affected portion(s) of the Work to the finish condition depicted in the Drawings and Specifications relating to such portion(s) of the Work. Contractor's obligations under the preceding sentence shall survive the termination of the Contract, the warranty period provided under the Contract Documents, the Contractor's completion of the Work or the District's acceptance of the Work. In the event that the Contractor shall fail or refuse, for any reason, to commence the removal and replacement of any material or product containing ACBMs forming a part of, or incorporated into the Work, within ten (10) days of the date of the District's written notice to the Contractor of the existence of ACBM materials or products in the Work, the District may thereafter proceed to cause the removal and replacement of such materials or products in any manner which the District determines to be reasonably necessary and appropriate; all costs, expenses and fees, incurred by the District in connection with such removal and replacement shall be the responsibility of the Contractor and the Contractor's Performance Bond Surety.

411.3 Encountering of Hazardous Materials. If the Contractor encounters Hazardous Materials at the Site which have not been rendered harmless or for which there is no provision in the Contract Documents for their containment, removal, abatement or handling, the Contractor shall immediately stop the Work in the affected area and shall immediately

notify the District, in writing, of such condition. The Contractor shall diligently proceed with the Work in all other unaffected areas. The Contractor shall proceed with the Work in the affected area only after the Hazardous Materials have been rendered harmless, contained, removed or abated. Adjustments, if any, to the Contract Time or Price shall be made in accordance with Articles 7 and 9.

4114 Material Safety Data Sheets. Contractor is required to insure that Material Safety Data Sheets (MSDS) for any material requiring a MSDS pursuant to the federal “hazard communication” standard or employee’s right-to-know law are available in a readily accessible place on the Work premises. The Contractor is also required to insure (i) the proper labeling of any substance brought onto the Work premises, and (ii) that the persons working with the material, or within the general area of the material, are informed about the hazards of the substance and follow proper handling and protection procedures.

4115 Compliance with Proposition 65. Contractor is required to comply with the provisions of California Health and Safety Code § 25249.5, et seq., which requires the posting and giving of notice to persons who may be exposed to any chemical known to the State of California to cause cancer. The Contractor agrees to familiarize itself with such statutory provisions and to fully comply with the requirements set forth therein.

412 Maintenance of Documents.

4121 Documents at Site. The Contractor shall maintain at the Site: (i) one record copy of the Drawings, Specifications and all addenda thereto; (ii) Change Orders approved by the District and all other modifications to the Contract Documents; (iii) Submittals reviewed by the Architect; (iv) Requests for Information and responses thereto; (v) Record Drawings; (vi) Material Safety Data Sheets (“MSDS”) accompanying any materials, equipment or products delivered or stored at the Site or incorporated into the Work; and (vii) all building and other codes or regulations applicable to the Work, including without limitation, Title 24, Part 2 of the California Code of Regulations. During performance of the Work, all documents maintained by Contractor at the Site shall be available to the District, the Project Manager, the Architect, the District’s Inspector and DSA for review, inspection or reproduction. Upon completion of the Work, all documents maintained at the Site by the Contractor pursuant to the foregoing, except for (vii), shall be assembled and transmitted to the District.

4122 Maintenance of Record Documents. During its performance of the Work, the Contractor shall continuously maintain Record Documents which are marked to indicate all field changes made to adapt the Work depicted in the Documents to field conditions, changes resulting from Change Orders and all concealed or buried installations, including without limitation, piping, conduit and utility services. The Record Documents shall be clean and all changes, corrections and dimensions shall be marked in a neat and legible manner in a contrasting color. The District’s inspection or review shall not be deemed to be the District’s approval or verification of the completeness or accuracy of the Record Documents. The

failure or refusal of the Contractor to continuously maintain complete and accurate Record Documents or to make available the Record Documents for inspection and review by the District may be deemed by the District to be Contractor's default of a material obligation hereunder. Payments to the Contractor are conditioned upon continuous maintenance and completion of the Record Documents pursuant to Articles 8.3.2 and 8.3.3. If the Contractor fails or refuses to continuously maintain the Record Documents in a complete and accurate manner, the District may take appropriate action to cause such maintenance, and all costs incurred in connection therewith shall be charged to the Contractor; the District may deduct such costs from any portion of the Contract Price then or thereafter due the Contractor.

413 Use of Site. The Contractor shall confine operations at the Site to areas permitted by law, ordinances or permits, subject to any restrictions or limitations set forth in the Contract Documents. The Contractor shall not unreasonably encumber the Site or adjoining areas with materials or equipment. The Contractor shall be solely responsible for providing security at the Site with all such costs included in the Contract Price. The District shall at all times have access to the Site.

414 Noise and Dust Control. The Contractor shall be responsible for complying with the requirements of the city and county having jurisdiction with regard to noise ordinances governing construction sites and activities. Construction equipment noise is subject to the control of the Environmental Protection Agency's Noise Control Program (Code of Federal Regulations, Title 40, Part 204). The Contractor shall be solely responsible for maintaining all areas of the Work free from all materials and products that by becoming airborne may cause respiratory inconveniences to District students and personnel. Damages and/or any liability derived from the Contractor's failure to comply with these requirements shall be the sole cost of the Contractor, including all penalties incurred for violations of local, state and/or federal regulations.

415 Cutting and Patching. The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make the component parts thereof fit together properly in accordance with the Contract Documents. Only tradespersons skilled and experienced in cutting and patching shall perform such work. The Contractor shall not damage or endanger any portion of the Work, or the fully or partially completed construction of the District or separate contractors by cutting, patching, excavation or other alteration. The Contractor shall not cut, patch or otherwise alter the construction by the District or separate contractor without the prior written consent of the District or separate contractor thereto, which consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold consent to the request of the District or separate contractor to cut, patch or otherwise alter the Work.

416 Clean-Up. The Contractor shall at all times keep the Site and all adjoining areas free from the accumulation of any waste material, rubbish or excess materials and equipment, placed, caused by performance of the Work. The Contractor shall maintain the Site in a "rake-clean" standard on a daily basis. Prior to completion of the Work, Contractor shall remove from the Site all rubbish, waste and excess material, tools, Construction Equipment, machinery, temporary facilities and barricades, and any other items which are not the property of the District under the Contract

Documents. Upon completion of the Work, the Site and all adjoining areas shall be left in a neat and broom clean condition satisfactory to District. The Project Manager is authorized to direct the Contractor's clean-up obligations hereunder. If the Contractor fails to clean up as provided for in the Contract Documents, the District may do so, and all costs incurred in connection therewith shall be charged to the Contractor; the District may deduct such costs from any portion of the Contract Price then or thereafter due the Contractor.

417 Access to the Work. The Contractor shall provide the DSA, the District, the Project Manager, the District's Inspector, the Architect and the Architect's consultant(s) with access to the Work, whether in place, preparation and progress and wherever located.

418 Information for the District's Inspector. The Contractor shall furnish the District's Inspector access to the Work for obtaining such information as may be necessary to keep the District's Inspector fully informed respecting the progress, quality and character of the Work and materials, equipment or other items incorporated therein.

419 Inspector's Field Office. The Contractor shall provide and include in the Contract Price a temporary furnished office at the Site, if specified in the Contract Documents, for use by the District, the Project Manager and the District's Inspector, until removal of the same is authorized by the District.

420 Patents and Royalties. The Contractor and the Surety shall defend, indemnify and hold harmless the District and its agents, employees and officers from any claim, demand or legal proceeding arising out of or pertaining, in any manner, to any actual or claimed infringement of patent rights in connection with performance of the Work under the Contract Documents.

421 Prevailing Wage Rates; Employment of Labor.

421.1 Determination of Prevailing Rates. Pursuant to the provisions of Division 2, Part 7, Chapter 1, Article 2 of the California Labor Code at §§1770 et seq., the District has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the prevailing rate for holiday and overtime work in the locality in which the Work is to be performed. These rates are on file at the District's principal office. The Contractor shall post, at appropriate and conspicuous locations on the Site, a schedule showing all determined general prevailing wage rates.

421.2 Payment of Prevailing Rates. This Project is a public works project as defined in Labor Code §1720, and must be performed in accordance with the requirements of Labor Code §§1720 to 1815 and Title 8 California Code of Regulations §§16000 to 17270, which govern the payment of prevailing wage rates on public works projects. The Contractor, and any Subcontractor, of any tier, shall pay their workers engaged in the Work not less than the general prevailing wage rate, regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor, of any tier, and such worker. Contractor, consistent with California Public Contract Code §6109, is prohibited from

performing a portion of work with a Subcontractor who is debarred pursuant to Labor Code §§1777.1 or 1777.7.

4213 Prevailing Wage Penalty. The Contractor shall, as a penalty, forfeit up to Fifty Dollars (\$50.00) to the District for each calendar day or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of the Department of Industrial Relations for such work or craft in which such worker is employed for the Work by the Contractor or by any Subcontractor, of any tier. Pursuant to California Labor Code §1775, the difference between prevailing wage rates and the amount paid to each worker each calendar day, or portion thereof, for which each worker paid less than the prevailing wage rate, shall be paid to each worker by the Contractor.

4214 Sufficient Contract Price. Contractor represents and warrants that the Contract Price includes sufficient funds to allow Contractor and all Subcontractors to comply with all applicable laws and contractual agreements. Contractor shall defend, indemnify and hold the District harmless from and against any and all claims, demands, losses, liabilities and damages arising out of or relating to the failure of Contractor or any Subcontractor to comply with any applicable law in this regard, including, but not limited to Labor Code §2810. Contractor agrees to pay any and all assessments, including wages, penalties, forfeitures and liquidated damages, made or asserted against the District in relation to any such failure.

4215 Payroll Records.

4215.1 Submission of Certified Payroll Records to District. Pursuant to California Labor Code §1776, the Contractor and each Subcontractor, of any tier, shall keep an accurate certified payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each person employed for the Work. If there is no work in a given week or on a given day, Contractor and each Subcontractor must keep a certified Non-Performance payroll record, indicating “no work” for that week or day(s). Contractor shall submit all certified payroll records to the Program Manager in complete, unredacted form with an original signature on the Statement of Compliance along with, and as a condition to, its Application for Payment.

4215.2 Inspection of Certified Payroll Records. Additionally, the certified payroll records shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis: (i) a certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or his/her authorized representative on request; (ii) a certified copy of all payroll records shall be made available for inspection or furnished upon request to the District, the Division of Labor Standards Enforcement and the Division of Apprenticeship Standards of the Department of Industrial Relations; (iii) a certified copy of all payroll records shall be made available upon request to the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the District, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided, the requesting

party shall, prior to being provided the records, reimburse the cost of preparation by the Contractor, Subcontractors and the entity through which the request was made. The public shall not be given access to such records at the principal office of the Contractor; (iv) the Contractor shall file a certified copy of the payroll records with the entity that requested such records within ten (10) days after receipt of a written request; (v) any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the District, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address and social security number. The name and address of the Contractor or any Subcontractor, of any tier, performing a part of the Work shall not be marked or obliterated. The Contractor shall inform the District of the location of payroll records, including the street address, city and county and shall, within five (5) working days, provide a notice of a change or location and address.

4.21.5.3 Submission of Payroll Records. Contractor shall provide, and shall cause all Subcontractors to provide, payroll records as defined in Title 8 California Code of Regulations §16000 to the District, within ten (10) days of written request, at no cost to the District. The District will not return documents to Contractor.

4.21.5.4 Penalty For Noncompliance. In the event of noncompliance with the requirements of this Article 4.21.5, the Contractor shall have ten (10) days in which to comply, subsequent to receipt of written notice specifying in what respects the Contractor must comply herewith. Should noncompliance still be evident after such 10-day period, the Contractor shall, as a penalty to the District, forfeit Twenty-Five Dollars (\$25.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from any portion of the Contract Price then or thereafter due the Contractor. The responsibility for compliance with the foregoing provisions shall rest upon the Contractor.

4.21.5.5 Liquidated Damages. Should Contractor neglect, fail or refuse to submit any documents pursuant to this Article 4.21.5, Contractor agrees to pay to the District the sum of twenty-five (\$25) dollars per worker per day in liquidated damages, not as a penalty but as liquidated damages, for every day beyond ten (10) days after such documents are due. The liquidated damages amounts are agreed upon by and between the Contractor and the District because of the difficulty of fixing the District's actual damages in the event of failure to submit such documents. The Contractor and District specifically agree that said amounts are reasonable estimates of the District's damages in such event, and that such amounts do not constitute a penalty. The Contractor and District acknowledge and agree that the liquidated damages contained in this provision are reasonable under the circumstances existing at the time of the Contractor's execution of the Contract.

4216 Hours of Work.

4.21.6.1 Limits on Hours of Work. Pursuant to California Labor Code §1810, eight (8) hours of labor shall constitute a legal day's work. Pursuant to California Labor Code §1811, the time of service of any worker employed at any time by the Contractor or by a Subcontractor, of any tier, upon the Work or upon any part of the Work, is limited and restricted to eight (8) hours during any one calendar day and forty (40) hours during any one calendar week, except as hereafter provided. Notwithstanding the foregoing provisions, Work performed by employees of Contractor or any Subcontractor, of any tier, in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1½) times the basic rate of pay.

4.21.6.2 Penalty for Excess Hours. The Contractor shall pay to the District a penalty of Twenty-five Dollars (\$25.00) for each worker employed on the Work by the Contractor or any Subcontractor, of any tier, for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any calendar day and forty (40) hours in any one calendar week, in violation of the provisions of Labor Code §1810 et seq.

4.21.6.3 Contractor Responsibility. Any Work performed by workers necessary to be performed after regular working hours or on Sundays or other holidays shall be performed without adjustment to the Contract Price or any other additional expense to the District.

4.21.7 Apprentices.

4.21.7.1 Employment of Apprentices. Labor Code §1777.5 and Title 8 California Code of Regulations §200 et seq. provide detailed requirements for employing apprentices on public works projects. Contractor is responsible for compliance with Labor Code §1777.5 and applicable regulations on the Project. This responsibility includes, but is not limited to, the obligation to employ properly registered apprentices and pay such apprentices at least the prevailing wage rate for their appropriate apprentice classification. Only apprentices, as defined in California Labor Code §3077 who are in training under apprenticeship standards and written apprenticeship agreements under California Labor Code §§3070 et seq. are eligible to be employed for the Work. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which such apprentice is training. Any apprentices employed to perform any of the Work shall be paid the standard wage paid to apprentices under the regulations of the craft or trade for which such apprentice is employed, and such individual shall be employed only for the work of the craft or trade to which such individual is registered. This Article 4.21.7 shall not apply to contracts of general contractors, or to contracts of specialty contractors not bidding for work through a general or prime contractor, when the contract involves less than Thirty Thousand Dollars (\$30,000.00). The term "Apprenticeable Craft or Trade," as used herein shall mean a craft or trade determined as an apprenticeable occupation in accordance with rules and regulations prescribed by the Apprenticeship Council.

4.21.7.2 Apprenticeship Certificate. When the Contractor or any Subcontractor, of any tier, in performing any of the Work employs workers in any Apprenticeable Craft or Trade, the Contractor and such Subcontractor shall apply to the Joint Apprenticeship Committee administering the apprenticeship standards of the craft or trade in the area of the site of the Work for and obtain a certificate approving the Contractor or such Subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected, provided, however, that the approval as established by the Joint Apprenticeship Committee or Committees shall be subject to the approval of the Administrator of Apprenticeship. Contractors or Subcontractors shall not be required to submit individual applications for approval to local Joint Apprenticeship Committees provided they are already covered by the local apprenticeship standards for that craft or trade.

4.21.7.3 Contract Award Information. Contractor shall submit contract award information using the Division of Apprenticeship Standards (DAS 140) Form to the applicable apprenticeship committee within ten (10) days of the date of execution of contract and no later than the first day of work as per Title 8 California Code of Regulations §230. Contractor shall submit a copy of the completed DAS 140 Form to the District's Labor Compliance Program at the same time.

4.21.7.4 Ratio of Apprentices to Journeymen. The ratio of Work performed by apprentices to journeymen, who shall be employed in the Work, may be no higher than the ratio stipulated in the apprenticeship standards under which the Joint Apprenticeship Committee operates, but in no case shall the ratio be less than one hour of apprentice work for each five hours of labor performed by a journeyman, except as otherwise provided in California Labor Code §1777.5. Any ratio shall apply during any day or portion of a day when any journeyman is employed at the site of the Work and shall be computed on the basis of the hours worked during the day by journeymen so employed. The Contractor shall employ apprentices for the number of hours computed as above before the end of the Contract, and Subcontractors before the end of the subcontract. The Contractor shall, however, endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the site of the Work. Any Work performed by a journeyman in excess of eight hours per day or 40 hours per week shall not be used to calculate the hourly ratio required by this Article. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of an apprenticeship committee, may order a minimum ratio of not less than one apprentice for each five journeymen in a craft or trade classification. Upon proper showing by the Contractor or Subcontractor that it employs apprentices in such craft or trade in the State of California on all of its contracts on an annual average of not less than one apprentice to each five journeymen, the Division of Apprenticeship Standards may grant a certificate exempting the Contractor from the 1-to-5 ratio as set forth in this Article and California Labor Code §1777.5.

4.21.7.5 Exemption from Ratios. The Joint Apprenticeship Committee shall have the discretion to grant a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting the Contractor from the 1-to-5 ratio set forth in this Article when it finds that any one of the following conditions are met: (i) unemployment for the previous three-month period in such area exceeds an average of fifteen percent (15%) or; (ii) the number of apprentices in training in such area exceeds a ratio of 1-to-5 in relation to journeymen, or; (iii) the Apprenticeable Craft or Trade is replacing at least one-thirtieth (1/30) of its journeymen annually through apprenticeship training, either on a statewide basis or on a local basis, or; (iv) if assignment of an apprentice to any Work performed under a public works contract would create a condition which would jeopardize such apprentice's life or the life, safety or property of fellow employees or the public at large, or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman. When such exemptions from the 1-to-5 ratio between apprentices and journeymen are granted to an organization which represents contractors in a specific trade on a local or statewide basis, the member contractors will not be required to submit individual applications for approval to local Joint Apprenticeship Committees, provided they are already covered by the local apprenticeship standards.

4.21.7.6 Contractor's Compliance. The responsibility of compliance with this Article for all Apprenticeable Trades or Crafts is that of the Contractor. In the event the Contractor knowingly fails to comply with the provisions of this Article and California Labor Code §1777.5, pursuant to California Labor Code §1777.7, the Contractor shall forfeit, as a civil penalty, not more than One Hundred Dollars (\$100.00) for each calendar day of noncompliance. A contractor or subcontractor that knowingly commits a second or subsequent violation of this Article and California Labor Code §1777.5 shall forfeit as a civil penalty not more than Three Hundred Dollars (\$300.00) for each calendar day of noncompliance. Notwithstanding the provisions of California Labor Code §1727, upon receipt of a determination that a civil penalty has been assessed by the Chief of the Division of Apprenticeship Standards, the District shall withhold such amount from the Contract Price then due or to become due. In the event a Contractor or Subcontractor is determined by the Chief to have knowingly committed a serious violation of Labor Code §1777.5, the Chief may also deny the Contractor or Subcontractor and its responsible officers the right to be on or be awarded or perform work as a subcontractor on any public works contract for a period of up to one (1) year for a first violation and up to three (3) years for a second or subsequent violation.

4.21.8 Employment of Independent Contractors. Pursuant to California Labor Code §1021.5, Contractor shall not willingly and knowingly enter into any agreement with any person, as an independent contractor, to provide any services in connection with the Work where the services provided or to be provided requires that such person hold a valid contractors license issued pursuant to California Business and Professions Code §§7000 et seq. and such person does not meet the burden of proof of his/her independent contractor status pursuant to California Labor Code §2750.5. In the event that Contractor shall employ

any person in violation of the foregoing, Contractor shall be subject to the civil penalties under California Labor Code §1021.5 and any other penalty provided by law. In addition to the penalties provided under California Labor Code §1021.5, Contractor's violation of this Article 4.21.8 or the provisions of California Labor Code §1021.5 shall be deemed an event of Contractor's default under Article 15.1 of these General Conditions. The Contractor shall require any Subcontractor of any tier performing or providing any portion of the Work to adhere to and comply with the foregoing provisions.

422 Labor Compliance Program. Pursuant to California Labor Code §1771.7, District has implemented a Labor Compliance Program. (See Section 00900). Contractor shall post "Notice of Initial Approval" of the District's Labor Compliance Program at the Site in accordance with 8 California Code of Regulations §16429. The Labor Compliance Program includes, without limitation, provisions requiring Contractor to comply with the prevailing rates of wages, maintenance and submission of weekly certified payroll records, employment of apprentices and, compliance with legal hours of work, and debarment. Contractor, and any Subcontractors, are required to comply with the requirements of the Labor Compliance Program, at no additional cost to District. Contractor shall include, and shall require the Subcontractors to include, contractual provisions in all contracts they enter into for the performance of the Work, requiring each Subcontractor, of every tier, who furnishes any labor for the performance of Work, to comply with these provisions at no additional cost. Contractor and all Subcontractors shall comply with California Labor Code §§1720-1781, applicable regulations and the Labor Compliance Program, and shall pay appropriate penalties for failure to comply pursuant to the California Labor Code, including, but not limited to, Sections 1775, 1776, 1777.7 and 1813, and the Labor Compliance Program. Contractor will be responsible for all failures by all Subcontractors, to comply with the District's LCP requirements. Contractor shall attend any pre-construction meetings held by the District and/or its Labor Compliance Program representatives to discuss labor requirements. Contractor and the Subcontractors shall allow the District, its Labor Compliance Program, the Department of Industrial Relations and designated representatives of each to conduct worker interviews at the Site during working hours. Compliance by Contractor with the requirements of this Article shall be a condition to Contractor's right to payment under its Applications for Payment. For questions or assistance concerning the Labor Compliance Program, please contact Lisa Wenninger, Director of Purchasing, 1051 South A Street, Oxnard, CA 93030, (805)487-3918, x241.

423 Assignment of Antitrust Claims. Pursuant to California Public Contract Code §7103.5, the Contractor and its Subcontractor(s), of any tier, hereby offers and agrees to assign to the District all rights, title and interest in and to all causes of action they may have under Section 4 of the Clayton Act, (15 U.S.C. §15) or under the Cartwright Act (California Business and Professions Code §§16700 et seq.), arising from purchases of goods, services or materials hereunder or any Subcontract. This assignment shall be made and become effective at the time the District tenders Final Payment to the Contractor, without further acknowledgment by the parties. If the District receives, either through judgment or settlement, a monetary recovery in connection with a cause of action assigned under California Public Contract Code §7103.5, the assignor thereof shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the District any portion of the recovery, including treble damages, attributable to overcharges that were

paid by the assignor but were not paid by the District as part of the Contract Price, less the expenses incurred by the District in obtaining that portion of the recovery. Upon demand in writing by the assignor, the District shall, within one year from such demand, reassign the cause of action assigned pursuant to this Article if the assignor has been or may have been injured by the violation of law for which the cause of action arose; and (i) the District has not been injured thereby; or (ii) the District declines to file a court action for the cause of action.

ARTICLE 5: SUBCONTRACTORS

51 Subcontracts. Any Work performed for the Contractor by a Subcontractor shall be pursuant to a written agreement between the Contractor and such Subcontractor which specifically incorporates by reference the Contract Documents and which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents. The foregoing notwithstanding, no contractual relationship shall exist, or be deemed to exist, between any Subcontractor and the District, unless the Contract is terminated and District, in writing, elects to assume the Subcontract. Each Subcontract for a portion of the Work shall provide that such Subcontract may be assigned to the District if the Contract is terminated by the District pursuant to Article 15.1 hereof, subject to the prior rights of the Surety obligated under a bond relating to the Contract. Upon request, the Contractor shall provide to the District copies of executed Subcontracts and Purchase Orders, including amendment thereto, to which Contractor is a party within seven (7) days of District's request for same. The Contractor's failure or refusal, for any reason, to provide copies of such Subcontracts or Purchase Orders shall be deemed the Contractor's default of a material term of the Contract Documents.

52 Substitution of Listed Subcontractor.

5.2.1 Substitution Process. Any request of the Contractor to substitute a listed Subcontractor will be considered only if such request is in strict conformity with this Article 5.2 and California Public Contract Code §4107. All costs and fees incurred by the District in the review and evaluation of a request to substitute a listed Subcontractor shall be borne by the Contractor; such costs and fees may be deducted by the District from the Contract Price then or thereafter due the Contractor.

5.2.2 Responsibilities of Contractor Upon Substitution of Subcontractor. Neither the substitution nor the District's consent to Contractor's substitution of a listed Subcontractor shall relieve Contractor from its obligation to complete the Work within the Contract Time and for the Contract Price. In the event that the District determines that revised or additional Submittals are required of the newly substituted Subcontractor, the District shall promptly notify the Contractor, in writing, of such requirement and the time for submittal. In the event that the revised or additional Submittals are not submitted by Contractor within the time specified, Contractor shall be subject to the per diem assessments for late Submittals as set forth in Article 4.8 of these General Conditions. Any revised or additional Submittals required pursuant to this Article 5.2.2 shall conform with the requirements of Article 4.8 of these General Conditions. Contractor shall reimburse the District for all fees and costs

incurred or associated with the processing, review and evaluation of any revised or additional Submittals required pursuant to this Article 5.2.2; the District may deduct such fees and costs from any portion of the Contract Price then or thereafter due the Contractor. In the event that additional or revised Submittals are required pursuant to this Article 5.2.2, such requirement shall not result in an increase to the Contract Time or the Contract Price.

ARTICLE 6: INSURANCE; INDEMNITY; BONDS

61 Workers' Compensation Insurance; Employer's Liability Insurance. The Contractor shall purchase and maintain Workers' Compensation Insurance as will protect the Contractor from claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Contractor shall purchase and maintain Employer's Liability Insurance covering bodily injury (including death) by accident or disease to any employee which arises out of the employee's employment by Contractor. The Employer's Liability Insurance required of Contractor hereunder may be obtained by Contractor as a separate policy of insurance or as an additional coverage under the Workers' Compensation Insurance required to be obtained and maintained by Contractor hereunder. The limits of liability for the Employer's Liability Insurance required hereunder shall be as set forth in the Special Conditions.

62 Commercial General Liability and Property Insurance. The Contractor shall purchase and maintain Commercial General Liability and Property Insurance covering the types of claims set forth below which may arise out of or result from Contractor's operations under the Contract Documents and for which the Contractor may be legally responsible: (i) claims for damages because of bodily injury, occupational sickness or disease or death of the Contractor's employees; (ii) claims for damages because of bodily injury, sickness or disease or death of any person other than the Contractor's employees; (iii) claims for damages insured by usual personal injury liability coverage which are sustained (a) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or (b) by another person; (iv) claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; (v) claims for damages because of bodily injury, death of a person or property damages arising out of ownership, maintenance or use of a motor vehicle; and (vi) contractual liability insurance applicable to the Contractor's obligations under the Contract Documents. Contractor shall also provide excess or umbrella liability limits for Products and Completed Operations Aggregate for this Project as a Designated Project as set forth in the Special Conditions.

63 Builder's Risk "All-Risk" Insurance. The District will maintain and cause to be maintained fire insurance for direct physical loss or damage excluding earthquake, flood and other perils (a copy of the District's policy is available upon request) on all Work to which this Contract applies for the insurable value thereof with a deductible clause not to exceed the first \$10,000 of

each loss, including items of labor and materials connected therewith, whether in or adjacent to the structure insured; materials in place or to be used as part of the permanent construction; temporary structures, miscellaneous materials and supplies incidental to the Work. The District's property insurance does not cover anything not specifically named above and does not include Contractor's tools, tools owned by mechanics, equipment, scaffolding, staging, towers and forms owned or rented by Contractor or Subcontractors, the capital value of which is not included in the Work. Contractor and Subcontractors are required to insure all materials, supplies, and property until they are delivered to the Site. Contractor shall be responsible for any damages and shall insure Contractor's payment of damages to the Work caused by perils insured by the District up to the \$10,000 deductible, and shall be additionally responsible for any damage to the structure or stored materials if caused by improperly installed or unprotected Work of this Contract and any damages to the Project, the Work, the materials or Contractor's tools, equipment, scaffolding, staging, towers and forms not covered by the District's insurance; provided that if such damage is caused by earthquake or tidal waves, and Contractor has installed the damaged Work in strict accordance with applicable building standards and the Contract Documents, then Contractor's liability shall be limited to five percent (5%) of the Contract Price, in accordance with Public Contract Code §7105. No claims for any loss or damage covered by the District's insurance shall be recognized by the District, nor will such loss or damage excuse the complete and satisfactory performance of the Contract by the Contractor.

64 Coverage Amounts. The insurance required of the Contractor hereunder shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater. In the event of any loss or damage covered by a policy of insurance required to be obtained and maintained by the Contractor hereunder, the Contractor shall be solely and exclusively responsible for the payment of the deductible, if any, under such policy of insurance, without adjustment to the Contract Price on account thereof.

65 Evidence of Insurance; Subcontractor's Insurance.

651 Certificates of Insurance. With the execution of the Contract, Contractor shall deliver to the District Certificates of Insurance evidencing the insurance coverages required by the Contract Documents. Failure or refusal of the Contractor to so deliver Certificates of Insurance may be deemed by the District to be a default of a material obligation of the Contractor under the Contract Documents. The Certificates of Insurance and the insurance policies required by the Contract Documents shall contain a provision that coverages afforded under such policies will not be canceled or allowed to expire until at least thirty (30) days prior written notice has been given to the District. The insurance policies required of Contractor hereunder shall also name the District as an additional insured as its interests may appear. Should any policy of insurance be canceled before Final Acceptance of the Work by the District and the Contractor fails to immediately procure replacement insurance as required, the District reserves the right to procure such insurance and to deduct the premium cost thereof and other costs incurred by the District in connection therewith from any sum then or thereafter due the Contractor under the Contract Documents. The Contractor shall, from time to time, furnish the District, when requested, with satisfactory proof of coverage of

each type of insurance required by the Contract Documents; failure of the Contractor to comply with the District's request may be deemed by the District to be a default of a material obligation of the Contractor under the Contract Documents.

652 Subcontractors' Insurance. Contractor shall require that every Subcontractor, of any tier, performing or providing any portion of the Work obtain and maintain the policies of insurance set forth in Articles 6.1 and 6.2 of these General Conditions; the coverages and limits of liability of such policies of insurance to be obtained and maintained by Subcontractors shall be as set forth in the Special Conditions. The policies of insurance to be obtained and maintained by Subcontractors hereunder are in addition to, and not in lieu of, Contractor obtaining and maintaining such policies of insurance. Each of the policies of insurance obtained and maintained by a Subcontractor hereunder shall conform with the requirements of this Article 6. Upon request of the District, Contractor shall promptly deliver to the District Certificates of Insurance evidencing that the Subcontractors have obtained and maintained policies of insurance in conformity with the requirements of this Article 6. Failure or refusal of the Contractor to provide the District with Subcontractors' Certificates of Insurance evidencing the insurance coverages required hereunder is a material default of Contractor hereunder.

66 Maintenance of Insurance. Any insurance bearing on the adequacy of performance of Work shall be maintained after the District's Final Acceptance of all of the Work for the full one year correction of Work period and any longer specific guarantee or warranty periods set forth in the Contract Documents. Should such insurance be canceled before the end of any such periods and the Contractor fails to immediately procure replacement insurance as specified, the District reserves the right to procure such insurance and to charge the cost thereof to the Contractor. Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from its operations or performance of the Work under the Contract Documents, including without limitation the Contractor's obligation to pay Liquidated Damages. In no instance will the District's exercise of its option to occupy and use completed portions of the Work relieve the Contractor of its obligation to maintain insurance required under this Article until the date of Final Acceptance of the Work by the District, or such time thereafter as required by the Contract Documents. The insurer providing any insurance coverage required hereunder shall be to the reasonable satisfaction of the District.

67 Contractor's Insurance Primary. All insurance and the coverages thereunder required to be obtained and maintained by Contractor hereunder, if overlapping with any policy of insurance maintained by the District, shall be deemed to be primary and non-contributing with any policy maintained by the District and any policy or coverage thereunder maintained by District shall be deemed excess insurance. To the extent that the District maintains a policy of insurance covering property damage arising out of the perils of fire or other casualty covered by the Contractor's Builder's Risk Insurance or the Commercial General Liability Insurance of the Contractor or any Subcontractor, the District, Contractor and all Subcontractors waive rights of subrogation against the others. The costs for obtaining and maintaining the insurance coverages required herein shall be

included in the Contract Price. The District, its Project Manager and Bond Consultant shall be endorsed on all policies provided by Contractor, as appropriate, as additional insureds as respects liability arising out of Contractor's or Subcontractors' performance of the terms and conditions of these Contract Documents.

68 Indemnity. Unless arising solely out of the active negligence, gross negligence or willful misconduct of the District, the Architect or the Project Manager, the Contractor shall indemnify, defend and hold harmless: (i) the District and its Board of Trustees, officers, employees, agents and representatives (including the District's Inspector); (ii) the Architect and its consultants for the Work and their respective agents and employees; and (iii) the Project Manager and its agents and employees from and against any and all damages, losses, claims, demands or liabilities whether for damages, losses or other relief, including, without limitation attorneys fees and costs which arise, in whole or in part, from the Work, the Contract Documents or the acts, omissions or other conduct of the Contractor or any Subcontractor or any person or entity engaged by them for the Work. The Contractor's obligations under the foregoing include without limitation: (i) injuries to or death of persons; (ii) damage to property; or (iii) theft or loss of property; and (iv) other losses, liabilities, damages or costs resulting from, in whole or part, any acts, omissions or other conduct of Contractor, any of Contractor's Subcontractors, of any tier, or any other person or entity employed directly or indirectly by Contractor in connection with the Work and their respective agents, officers or employees. If any action or proceeding, whether judicial, administrative, arbitration or otherwise, shall be commenced on account of any claim, demand or liability subject to Contractor's obligations hereunder, and such action or proceeding names the District as a party thereto, the Contractor shall, at its sole cost and expense, defend the District in such action or proceeding with counsel reasonably satisfactory to District. In the event that there shall be any judgment, award, ruling, settlement, or other relief arising out of any such action or proceeding to which the District is bound by, Contractor shall pay, satisfy or otherwise discharge any such judgment, award, ruling, settlement or relief; Contractor shall indemnify and hold harmless the District from any and all liability or responsibility arising out of any such judgment, award, ruling, settlement or relief. The Contractor's obligations hereunder are binding upon Contractor's Performance Bond Surety and these obligations shall survive notwithstanding Contractor's completion of the Work or the termination of the Contract.

69 Payment Bond; Performance Bond. Prior to commencement of the Work, the Contractor shall furnish a Performance Bond as security for Contractor's faithful performance of the Contract and a Labor and Material Payment Bond as security for payment of persons or entities performing work, labor or furnishing materials in connection with Contractor's performance of the Work under the Contract Documents. The amounts of the Performance Bond and the Payment Bond required hereunder shall be one hundred percent (100%) of the Contract Price. Said Labor and Material Payment Bond and Performance Bond shall be in the form and content set forth in the Contract Documents. The failure or refusal of the Contractor to furnish either the Performance Bond or the Labor and Material Payment Bond in strict conformity with this Article 6.9 may be deemed by the District as a default by the Contractor of a material obligation hereunder. Upon request of the Contractor, the District may consider and accept, but is not obligated to do so, multiple sureties on such bonds. The Surety on any bond required under the Contract Documents shall be an Admitted

Surety Insurer as that term is defined in California Code of Civil Procedure §995.120.

ARTICLE 7: CONTRACT TIME

71 Final Completion of the Work Within Contract Time. Unless otherwise expressly provided in the Contract Documents, the Contract Time is the period of time, including authorized adjustments thereto, allotted in the Contract Documents for achieving Final Completion of the Work. The date for commencement of the Work is the date established by the Notice to Proceed issued by the District, which shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible. The date of Final Completion is the date certified by the Architect, the Project Manager and the District's Inspector as such in accordance with the Contract Documents. The Contract Time is as indicated in the Special Conditions.

72 Progress and Completion of the Work.

721 Time of Essence. Time limits stated in the Contract Documents are of the essence. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing and achieving Final Completion of the Work. The Contractor shall employ and supply a sufficient force of workers, material and equipment, and prosecute the Work with diligence so as to maintain progress, to prevent Work stoppage and to achieve Final Completion of the Work within the Contract Time.

722 Substantial Completion. Substantial Completion is that stage in the progress of the Work when the Work is complete in accordance with the Contract Documents, including but not limited to start-up and testing, so the District can occupy or use the Work and Project for its intended purpose; provided that, as a condition precedent to Substantial Completion, the Architect and District's Inspector shall have each agreed that the Work and Project have reached a stage of substantial completion and the District shall have received all permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial use of the Project. Substantial Completion shall be determined by the Architect and the District's Inspector upon request by the Contractor in accordance with the Contract Documents. The good faith and reasonable determination of Substantial Completion by the District's Inspector and the Architect shall be controlling and final.

723 Correction or Completion of the Work After Substantial Completion. Upon achieving Substantial Completion of the Work, the District, the District's Inspector, the Project Manager, the Architect and the Contractor shall jointly inspect the Work and prepare a comprehensive list of items of the Work (punch list) to be corrected or completed by the Contractor. The exclusion of, or failure to include, any item on such list shall not alter or limit the obligation of the Contractor to complete or correct any portion of the Work in accordance with the Contract Documents. In the event that the Contractor shall fail or refuse, for any reason, to complete all punch list items within the Contract Time, Contractor shall be subject to assessment of Liquidated Damages in accordance with Article 7.4 hereof. If the Contractor fails or refuses to complete all items of the Work within the Contract Time, the

District may, in its sole and exclusive discretion and without further notice to Contractor, elect to cause the completion of such items of the Work, provided, however, that such election by the District is in addition to, and not in lieu of, any other right or remedy of the District under the Contract Documents or at law. If the District elects to complete items of the Work, Contractor shall be responsible for all costs incurred by the District in connection therewith and the District may deduct such costs from the Contract Price then or thereafter due the Contractor; if these costs exceed the remaining Contract Price due to the Contractor, the Contractor and the Performance Bond Surety are liable to District for any such excess costs.

724 Final Completion. Final Completion is that stage of the Work when all Work has been completed in accordance with the Contract Documents, including without limitation, the performance of all punch list items noted upon Substantial Completion, and the Contract has been otherwise fully performed by the Contractor. Final Completion shall be determined by the Architect and the District's Inspector upon request of the Contractor. The good faith and reasonable determination of Final Completion by the District's Inspector and the Architect shall be controlling and final.

725 Contractor Responsibility for Multiple Inspections. In the event the Contractor shall request determination of Substantial or Final Completion and it is determined by the District that the Work does not then justify certification of Substantial or Final Completion, as applicable, and re-inspection is required at a subsequent time to make such determination, the Contractor shall be responsible for all costs of such re-inspection, including without limitation, the fees of the Architect and the salary of the District's Inspector. The District may deduct such costs from the Contract Price then due or thereafter due to the Contractor.

726 Final Acceptance. Final Acceptance of the Work shall occur upon approval of the Work by the District's Board of Trustees. Such approval shall be submitted for adoption at the next regularly scheduled meeting of the District's Board of Trustees after the determination of Final Completion. The commencement of any warranty or guarantee period under the Contract Documents shall be deemed to be the date upon the District's Board of Trustees approves of the Final Acceptance of the Work.

73 Progress Schedule.

731 Submittal of Preliminary Construction Schedule. Within ten (10) days following execution of the Agreement, the Contractor shall prepare and submit to the District, the Project Manager and the Architect a Preliminary Construction Schedule, in both written and electronic format, indicating, in graphic and tabular form, the estimated rate of progress and sequence of all Work required under the Contract Documents. The purpose of the Preliminary Construction Schedule is to assure adequate planning and execution of the Work so that it is completed within the Contract Time and to permit evaluation of the progress of the Work. The Preliminary Construction Schedule shall indicate the dates for commencement and completion of various portions of the Work, including, without limitation, the procurement and fabrication of major items, material and equipment forming a part of, or to be incorporated into, the Work as well as Site construction activities and the

date Contractor will achieve Substantial Completion and Final Completion of the Project. The Preliminary Construction Schedule shall identify all major (critical) Submittals required, the portion(s) of the Work for which the identified Submittals relate to and the date upon which each Submittal required will be transmitted to the Architect for review (the "Submittal Schedule"). The Contractor shall prepare the Preliminary Construction Schedule using Primavera or comparable software in Critical Path Method format. If Contractor elects to use software other than Primavera, Contractor shall provide such software to the District at Contractor's expense. These requirements shall not be deemed control over or assumption of construction means, methods or sequences, all of which remain the Contractor's responsibility. Further, these requirements shall not give rise to an increase in the Contract Time or the Contract Price. The Contractor may submit a Preliminary Construction Schedule depicting completion of the Work in a duration shorter than the Contract Time; provided that such Preliminary Construction Schedule shall not be a basis for adjustment to the Contract Price in the event that completion of the Work shall occur after the time depicted therein, nor shall such Preliminary Construction Schedule be the basis for any extension of the Contract Time, the Contractor's entitlement to any extension of the Contract Time shall be based upon the Contract Time and not on any shorter duration which may be depicted in the Contractor's Preliminary Construction Schedule. In the event any of the Construction Schedules required under this Article 7.3 incorporate therein "float" time, such float shall be deemed to belong to and owned by the District. As used herein, "float time" shall be deemed to refer to the time between the earliest start date and the latest start date, or between the earliest finish date and the latest finish date of each activity shown on the Construction Schedule.

732 Review of Preliminary Construction Schedule. The District, the Project Manager and the Architect shall review the Preliminary Construction Schedule submitted by the Contractor pursuant to Article 7.3.1 above for conformity with the requirements of the Contract Documents. Within fifteen (15) days of the date of receipt of the Preliminary Construction Schedule, such Schedule will be returned to the Contractor with comments to the form or content thereof. Review of the Preliminary Progress Schedule and any comments thereto by the District, the Project Manager and/or the Architect shall not be deemed to be the assumption of construction means, methods or sequences by the District, the Project Manager or the Architect, all of which remain the Contractor's obligations under the Contract Documents.

733 Preparation and Submittal of Contract Construction Schedule. Within ten (10) days of the District's return of the Preliminary Construction Schedule to the Contractor pursuant to Article 7.3.2 above, the Contractor shall prepare and submit the Cost Loaded Construction Schedule which incorporates therein the comments to the Preliminary Construction Schedule. Upon the Contractor's submittal of such Construction Schedule, the District shall review the same for purposes of determining conformity with the requirements of the Contract Documents. Within fifteen (15) days of the receipt of the Construction Schedule, the District will approve such Construction Schedule or will return the same to the Contractor with comments to the form or content. In the event there are comments to the form or content thereof, the Contractor, shall within seven (7) days of receipt of such

comments, revise and resubmit the Construction Schedule incorporating therein such comments. Upon the District's approval of the form and content of a Construction Schedule, the same shall be deemed the "Approved Construction Schedule." The District's approval of a Construction Schedule shall be for the sole and limited purpose of determining conformity with the requirements of the Contract Documents. By the Approved Construction Schedule, the District shall not be deemed to have exercised control over, or approval of, construction means, methods or sequences, all of which remain the responsibility and obligation of the Contractor in accordance with the terms of the Contract Documents. Further, the Approved Construction Schedule shall not operate to limit or restrict any of Contractor's obligations under the Contract Documents nor relieve the Contractor from the full, faithful and timely performance of such obligations in accordance with the terms of the Contract Documents. The activities, commencement and completion dates of activities, and the sequencing of activities depicted on the Approved Construction Schedule shall not be modified or revised by the Contractor without the prior consent, or direction, of the District. Updates to the Approved Construction Schedule pursuant to Article 7.3.5 below shall not be deemed revisions to the Approved Construction Schedule. In the event that the Approved Construction Schedule shall depict completion of the Work in a duration shorter than the Contract Time, the same shall not be a basis for an adjustment of the Contract Time or the Contract Price in the event that actual completion of the Work shall occur after such the time depicted in such Approved Construction Schedule. In such event, the Contract Price shall not be subject to adjustment on account of any additional costs incurred by the Contractor to complete the Work prior to the Contract Time, as adjusted in accordance with the terms of the Contract Documents. Any adjustment of the Contract Time or the Contract Price shall be based upon the Contract Time set forth in the Contract Documents and not any shorter duration which may depicted in the Approved Construction Schedule.

7.3.4 Revisions to Approved Construction Schedule. In the event that the progress of the Work or the sequencing of the activities of the Work shall materially differ from that indicated in the Approved Construction Schedule, as determined by the District in its reasonable discretion and judgment, the District may direct the Contractor to revise the Approved Construction Schedule; within fifteen (15) days of the District's direction, the Contractor shall prepare and submit a revised Approved Construction Schedule, for review and approval by the District. The Contractor may request consent of the District to revise the Approved Construction Schedule. Any such request shall be considered by the District only if in writing setting forth the Contractor's proposed revision(s) to the Approved Construction Schedule and the reason(s) therefor. The District may consent to, or deny, any such request of the Contractor to revise the Approved Construction Schedule in its reasonable discretion.

7.3.5 Updates to Approved Construction Schedule. The Contractor shall monitor and update the Approved Construction Schedule on a monthly basis, or more frequently as required by the conditions or progress of the Work, or as may be requested by the District. Proper and complete updating of the Approved Construction Schedule shall be a condition precedent to the issuance of progress payments described in Article 8 of these General Conditions. The Contractor shall provide the District with updated Approved Construction

Schedules indicating progress achieved and activities commenced or completed within the prior updated Approved Construction Schedule. Updates to the Approved Construction Schedule shall not include any revisions to the activities, commencement and completion dates of activities or the sequencing of activities depicted on the Approved Construction Schedule without the District's consent. Any revisions to the Approved Construction Schedule made without the District's consent shall result in the District's rejection of such update and Contractor shall, within seven (7) days of the District's rejection of such update, submit to the Architect and the Project Manager an Updated Approved Construction Schedule which does not incorporate any such revisions. The Contractor shall also submit, with its updates to the Approved Construction Schedule, a narrative statement including a description of current and anticipated problem areas of the Work, logic and resource changes, delaying factors and their impact, and an explanation of corrective action taken or proposed by the Contractor. If the progress of the Work is behind the Approved Construction Schedule, the Contractor shall indicate what measures will be taken to place the Work back on schedule. The District may, from time to time, and in the District's sole and exclusive discretion, transmit to the Contractor's Performance Bond Surety the Approved Construction Schedule, any updates thereof and the narrative statement described hereinabove. The District's election to transmit, or not to transmit such information, to the Contractor's Performance Bond Surety shall not limit the Contractor's obligations under the Contract Documents.

73.6 Contractor Responsibility for Construction Schedule. The Contractor shall be responsible for the preparation, submittal and maintenance of the Construction Schedules required by the Contract Documents, and any failure of the Contractor to do so may be deemed by the District as the Contractor's default in the performance of a material obligation under Contract Documents. Any and all costs or expenses required or incurred to prepare, submit, maintain, and update the Construction Schedules shall be solely that of the Contractor and no such cost or expense shall be charged to the District. The Contract Price shall not be subject to adjustment on account of costs, fees or expenses incurred or associated with the Contractor's preparation, submittal, maintenance or updating of the Construction Schedules. All schedule submittals shall include electronic diskettes for use by the District in its analysis and approval of the schedule submittal.

74 Adjustment of Contract Time. If Final Completion or completion of an Interim Milestone is delayed, adjustment, if any, to the Contract Time on account of such delay shall be in accordance with this Article 7.4 and will be made, if at all, by written Change Order made in accordance with Article 9.

74.1 Excusable Delays. If Final Completion of the Work is delayed by Excusable Delays, the Contract Time shall be subject to adjustment for such reasonable period of time as determined by the District. Excusable Delays shall not result in any increase in the Contract Price. Excusable Delays refer to unforeseeable and unavoidable casualties or other unforeseen causes beyond the control, and without fault or neglect, of the Contractor, any Subcontractor, Material Supplier or other person directly or indirectly engaged by the

Contractor in performance of any portion of the Work. Excusable Delays include unanticipated and unavoidable labor disputes, unusual and unanticipated delays in transportation of equipment, materials or Construction Equipment reasonably necessary for completion and proper execution of the Work, and unanticipated unusually severe weather conditions. Neither the financial resources of the Contractor or any person or entity directly or indirectly engaged by the Contractor in performance of any portion of the Work shall be deemed conditions beyond the control of the Contractor. If an event of Excusable Delay occurs, the Contract Time shall be subject to adjustment hereunder only if the Contractor establishes: (i) full compliance with all applicable provisions of the Contract Documents relative to the method, manner and time for Contractor's notice and request for adjustment of the Contract Time; (ii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time are outside the reasonable control and without any fault or neglect of the Contractor or any person or entity directly or indirectly engaged by Contractor in performance of any portion of the Work; and (iii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time directly and adversely impacted the progress of the Work as indicated in the most recent updated Approved Construction Schedule relative to the date(s) of the claimed event(s) of Excusable Delay. The foregoing provisions notwithstanding, if the Special Conditions set forth a number of "Rain Days" to be anticipated during performance of the Work, the Contract Time shall not be adjusted for rain related unusually severe weather conditions until and unless the actual number of Rain Days during performance of the Work shall exceed those noted in the Special Conditions and such additional Rain Days shall have directly and adversely impacted the progress of the Work as depicted in the Approved Construction Schedule or the most recent updated Approved Construction Schedule relative to the date(s) of such additional Rain Days.

7.4.2 Compensable Delays. If Final Completion of the Work is delayed and such delay is caused by the acts or omissions of the District, the Architect, the Project Manager or separate contractor employed by the District (collectively "Compensable Delays"), upon Contractor's request and notice, in strict conformity with Articles 7 and 9 of these General Conditions, the Contract Time will be adjusted by Change Order for such reasonable period of time as determined by the Architect, Project Manager and the District. In accordance with California Public Contract Code § 7102, if the Contractor's progress is delayed by any of the events described in the preceding sentence, Contractor shall not be precluded from the recovery of damages directly and proximately resulting therefrom, provided that the District is liable for the delay, the delay is unreasonable under the circumstances involved and the delay was not within the reasonable contemplation of the District and the Contractor at the time of execution of the Agreement. In such event, Contractor's damages, if any, shall be limited to direct, actual and unavoidable additional costs of labor, materials or Construction Equipment directly resulting from such delay, and shall exclude indirect or other consequential damages. In no event shall Contractor's damages exceed the mark-up amount(s) set forth in the Special Conditions and in accordance with Article 9.4.1.3.4. Except as expressly provided for herein, Contractor shall not have any other claim, demand or right to adjustment of the Contract Price arising out of delay, interruption, hindrance or disruption to the progress of the

Work. Adjustments to the Contract Price and the Contract Time, if any, on account of Changes to the Work or Suspension of the Work shall be governed by the applicable provisions of the Contract Documents, including without limitation, Articles 9 and 14 of these General Conditions.

7.4.3 Unexcusable Delays. Unexcusable Delays refer to any delay to the progress of the Work caused by events or factors other than those specifically identified in Articles 7.4.1 and 7.4.2 above. Neither the Contract Price nor the Contract Time shall be adjusted on account of Unexcusable Delays.

7.4.4 Adjustment of Contract Time.

7.4.4.1 Procedure for Adjustment of Contract Time. The Contract Time shall be subject to adjustment only in strict conformity with applicable provisions of the Contract Documents. Failure of Contractor to request adjustment(s) of the Contract Time in strict conformity with applicable provisions of the Contract Documents shall be deemed Contractor's waiver of the same.

7.4.4.2 Limitations Upon Adjustment of Contract Time on Account of Delays. Any adjustment of the Contract Time on account of an Excusable Delay or a Compensable Delay shall be limited as set forth herein. No adjustment of the Contract Time shall be made on account of any Excusable Delays or Compensable Delays unless such delay(s) actually and directly impact Work or Work activities on the critical path of the then current and updated Approved Construction Schedule as of the date on which such delay first occurs. The District shall not be deemed in breach of, or otherwise in default of any obligation hereunder, if the District shall deny a request by the Contractor for an adjustment of the Contract Time for any delay which does not actually and directly impact Work on the then current and updated Approved Construction Schedule. In submitting a request for an adjustment of Contract Time, and as a condition precedent to the District's review of such request, Contractor shall insert into the then current and updated Approved Construction Schedule a "fragnet" analysis representing the event which Contractor claims to result in delay to the critical path as depicted in such updated Approved Construction Schedule. If an Excusable Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of days from the commencement of the first delay to the cessation of the delay which ends last. If an Unexcusable Delay occurs concurrently with either an Excusable Delay or a Compensable Delay, the maximum extension of the Contract Time shall be the number of days, if any, which the Excusable Delay or the Compensable Delay exceeds the period of time of the Unexcusable Delay.

7.5 Liquidated Damages; Contractor Delays. Pursuant to Government Code §53069.85, should the Contractor not achieve Final Completion of the Work within the Contract Time, as adjusted, or to complete an Interim Milestone in accordance with the times specified or provided for in the Contract Documents, the Contractor shall forfeit and pay to the District the amount of per diem Liquidated Damages set forth in the Special Conditions, for every day beyond the Contract Time, as adjusted, or Interim Milestone, the Work is achieved. Any such Liquidated Damages are

automatically and without notice of any kind forfeited by Contractor upon the accrual of each day of delay. The District may at any time deduct Liquidated Damages from any payments due or to become due to the Contractor. Neither the District's failure or delay in deducting Liquidated Damages from payments otherwise due the Contractor, nor the District's failure or delay in notifying Contractor of the forfeiture of Liquidated Damages, shall be deemed a waiver of the District's right to Liquidated Damages. The Contractor and the Surety shall be liable for and pay to the District the entire amount of Liquidated Damages including any portion that exceeds the amount of the Contract Price then held, retained or controlled by the District. The Contractor and District acknowledge and agree that the Liquidated Damages and the provisions of this Article 7.5 are reasonable and necessary under the circumstances existing at the time this Contract is made because of the difficulty of fixing the District's actual damages in the event of delayed completion of the Work. The Contractor and the District agree that the Liquidated Damages do not constitute a penalty.

7.6 District Right to Take-Over Work. Unless caused by the District, Architect, Project Manager or the Inspector, if the Contractor fails or refuses, for any reason and at any time, to furnish adequate materials, labor, equipment or services to maintain progress of the Work in accordance with the then current Construction Schedule after twenty-four (24) hour advance written notice from the District to the Contractor of its failure or refusal, the District may thereafter furnish or cause to be furnish such materials, labor, equipment or services necessary to maintain progress of the Work in accordance with the then current Construction Schedule. All costs, expenses or other charges (whether direct, indirect or administrative) incurred by the District in furnishing such materials, labor, equipment or services shall be at the sole cost of the Contractor and the District may deduct the same from the Contract Price then or thereafter due the Contractor. The District's exercise of rights pursuant to the foregoing shall not be deemed a waiver or limitation of any other right or remedy of the District under the Contract Documents.

ARTICLE 8: CONTRACT PRICE

81 Contract Price. The Contract Price is the amount stated in the Agreement as such, and subject to any authorized adjustments thereto in accordance with the Contract Documents, is the total amount payable by the District to the Contractor for performance of the Work under the Contract Documents. The District's payment of the Contract Price to the Contractor shall be in accordance with the Contract Documents.

82 Cost Breakdown (Schedule of Values). Within ten (10) days of the Cost Loaded Contract Construction Schedule (Article 7.3.3), the Contractor shall furnish a detailed tabular Cost Breakdown (Schedule of Values) of the Contract Price consistent with the cost-loaded work activities included in the Approved Construction Schedule. In preparing the Cost Breakdown, Contractor shall carefully list the true cost of each activity or item for which payment will be requested. The Contractor shall not "front-load" the Cost Breakdown with false dollar amounts for activities to be performed in the early stages of the Project. The District may, in its sole discretion, utilize the costs listed in the Cost Breakdown (Schedule of Values) as the true cost of items to be deducted from the Contract Price through credit or deductive Change Order. The values for each line item shall include the amount of

overhead and profit applicable to each item of work and shall include, at a minimum, a breakdown between rough and finish Work for the basic trades as well as individual dollars figures for large dollar equipment and materials to be installed or furnished for the Project. No individual line item or scope of work in the Cost Breakdown shall exceed \$50,000, except with the express, written consent of the District. Exceptions will be given by the District for a single item of Equipment for which the true cost exceeds \$50,000. The Cost Breakdown shall be subject to the District's review and approval of the form and content thereof. Upon request, Contractor shall provide District with data and documentation substantiating the accuracy of the proposed line items. In the event that the District shall reasonably object to any portion of the Cost Breakdown, within ten (10) days of the District's receipt of the Cost Breakdown, the District shall notify the Contractor, in writing of the District's objection(s) to the Cost Breakdown together with any request for substantiating data or documentation. Within five (5) days of the date of the District's written objection(s) and request for substantiating data and documentation, Contractor shall submit a revised Cost Breakdown to the District for review and approval together with the requested data and documentation. The foregoing procedure for the preparation, review and approval of the Cost Breakdown shall continue until the District has approved of the entirety of the Cost Breakdown. Once the Cost Breakdown is approved by the District, the Cost Breakdown shall not be thereafter modified or amended by the Contractor without the prior consent and approval of the District, which may be granted or withheld in the sole reasonable discretion of the District. Notwithstanding any provision of the Contract Documents to the contrary, payment of the Contractor's overhead, supervision and general conditions costs and profit, as such items are reflected in the Cost Breakdown, shall be made incrementally as included in the activities included in the Approved Construction Schedule.

83 Progress Payments.

831 Applications for Progress Payments. During the Contractor's performance of the Work, the Contractor shall submit monthly, on the first working day of each month, to the Project Manager, Applications for Progress Payments, on forms approved by the District, setting forth an itemized estimate of Work completed in the preceding month. Values utilized in the Applications for Progress Payments shall be based upon the proper updating of the Approved Construction Schedule. The Cost Breakdown and/or Approved Cost Loaded Construction Schedule, pursuant to Article 8.2 above, and such values shall be only for determining the basis of Progress payments to the Contractor, and shall not be considered as fixing a basis for adjustments, whether additive or deductive, to the Contract Price.

832 District's Review of Applications for Progress Payments. In accordance with Public Contract Code §20104.50, upon receipt of an Application for Progress Payment, the Project Manager, the District's Inspector, and the Architect shall review the Application. Such review shall be for the purpose of determining that the Application for Progress Payment is a proper Progress Payment request. For purposes of this Article 8.3.2, an Application for Progress Payment shall be deemed "proper" only if it is submitted on the properly completed form approved by the District, and accompanied by:

- (i) the Application submitted by the Contractor shall be consistent with and accompanied by the updated Approved Construction Schedule;

- (ii) weekly Certified Payroll Records (“CPRs”) of the Contractor and all Subcontractors, of any tier, for laborers performing any portion of the Work for which a Progress Payment is included. The District shall not make any payment to Contractor until (a) Contractor and/or its Subcontractor(s) provide CPRs acceptable to the District, and (b) the District is given sufficient time to review and/or audit the CPRs to determine their acceptability. Any delay in Contractor and/or its Subcontractor(s) providing CPRs to the District in a timely manner will delay the District’s review and/or audit of the CPRs and Contractor’s payment;
- (iii) duly completed and executed forms of Conditional Waiver and Release of Rights Upon Progress Payment in accordance with California Civil Code §3262 of the Contractor, all Subcontractors of any tier, and Material Suppliers covering the Progress Payment requested;
- (iv) duly completed and executed forms of Unconditional Waiver and Release of Rights upon Progress Payment in accordance with California Civil Code §3262 of the Contractor, all Subcontractors of any tier, and Material Suppliers covering the Progress Payment received by the Contractor under the prior Application for Progress Payment;
- (v) all documents required pursuant to the District’s Labor Compliance Program; and
- (vi) updated Record Documents reflecting the actual as-built conditions of the Work performed, as reviewed by the Architect.

In accordance with Public Contract Code §20104.50, an Application for Progress Payment determined by the District not to be a proper Application for Progress Payment shall be returned by the District to the Contractor as soon as is practicable after receipt of the same from the Contractor, but in no event not more than seven (7) days after the District's receipt thereof. The District's return of any Application for Progress Payment pursuant to the preceding sentence shall be accompanied by a written document setting forth the reason(s) why the Application for Progress Payment is not proper.

833 Architect and District's Inspector Review of Applications for Progress Payments. Upon receipt of an Application for Progress Payment, the Architect and the District's Inspector shall meet with the Contractor to inspect the completed work and verify the portion of the work completed during the month using the approved Construction Schedule update and the Cost Breakdown. The Application for Progress Payment shall reflect the agreed percentages of work complete that is properly due to the Contractor under the terms of the Contract Documents. The Application submitted by the Contractor shall be consistent with and accompanied by the updated Approved Construction Schedule.

834 District's Disbursement of Progress Payments.

8.3.4.1 Timely Disbursement of Progress Payments. In accordance with Public Contract Code § 20104.50, within thirty (30) days after the District's receipt of a proper Application for Progress Payment, there shall be paid, by District, to Contractor a sum

equal to ninety-five percent (95%) of the value of the Work indicated in the Application for Progress Payment as verified and approved by the District's Inspector and the Architect. If an Application for Progress payment is determined not to be proper due to the failure or refusal of the contractor to submit the required documents with the Application for progress payment, or if it is reasonably determined that the Record Documents have not been continuously maintained to reflect the actual as-built conditions of the Work completed in the period for which the Progress Payment is requested, the thirty (30) day period hereunder for the District's timely disbursement of a Progress payment shall be deemed to commence on the date that the District is actually in receipt of a complete and proper Application for Progress payment or verifies the proper updating of the as-built conditions.

83.4.2 Untimely Disbursement of Progress Payments. In accordance with Public Contract Code §20104.50, in the event that the District shall fail to make any Progress Payment within thirty (30) days after receipt of an undisputed and properly submitted Application for Progress Payment, the District shall pay the Contractor interest on the undisputed amount of such Application for Progress Payment equal to the legal rate of interest set forth in California Code of Civil Procedure § 685.010(a).

83.4.3 District's Right to Disburse Progress or Final Payments by Joint Checks. The District may, in its sole discretion, issue joint checks to the Contractor and any Subcontractor or Material Supplier providing work, labor, materials, equipment or services for the Project in satisfaction of its obligation to make Progress Payments or the Final Payment due hereunder. District may require Contractor to provide copies of applicable Subcontracts, purchase orders, rental invoices or materials invoices.

83.4.4 No Waiver of Defective or Non-Conforming Work. The approval of any Application for Progress Payment or the disbursement of any Progress Payment to the Contractor shall not be deemed nor constitute acceptance of defective Work or Work not in conformity with the Contract Documents.

835 Progress Payments for Changed Work. The Contractor's Applications for Progress Payment may include requests for payment on account of Changes in the Work which have been properly authorized and approved by the District's Inspector, the Architect and the Board. Except as provided for herein, no other payment shall be made by the District for Changes in the Work.

836 Materials or Equipment Not Incorporated Into the Work.

83.6.1 Limitations Upon Payment. Except as expressly provided for herein, no payments shall be made by the District on account of any item of the Work, including without limitation, materials or equipment which has/have not been incorporated into and made a part of the Work.

83.6.2 Materials or Equipment Delivered and Stored at the Site. The District may, in its sole and exclusive discretion, make payment for materials or equipment not yet incorporated into the Work if, a request for payment of such materials or equipment is

made and if all of the following are complied with: (a) the materials or equipment have been delivered to the Site; (b) adequate arrangements, reasonably satisfactory to the District, have been made by the Contractor to store and protect such materials or equipment at the Site including without limitation, insurance reasonably satisfactory to the District, covering and protecting against the risk of loss, destruction, theft or other damage to such materials or equipment while in storage; and (c) the establishment of procedures reasonably satisfactory to the District by which title to such materials or equipment will be vested in the District upon the District's payment therefor. The Contractor acknowledges that the discretion to make, or not to make, payment for materials or equipment delivered or stored at the site of the Work pursuant to the preceding sentence shall be exercised exclusively by the District; the District's exercise of discretion not to make payment for materials or equipment delivered or stored at the Site, but not yet incorporated into the Work shall not be deemed the District's default hereunder. In the event that the District shall elect to make payment for materials or equipment delivered and stored at the Site, the costs and expenses incurred to comply with the requirements of (b) and (c) of this Article 8.3.6.2 shall be borne solely and exclusively by the Contractor and no payment shall be made by the District on account of such costs and expenses.

837 Exclusions From Progress Payments. No payments shall be made by the District for materials or equipment to be incorporated into the Work where such materials or equipment have not been delivered or stored at the Site. The District shall not make any payment on account of any materials or equipment which are in the process of being fabricated or which are in transit to the Site or other storage location. In addition to the District's right to withhold disbursement of any Progress Payment provided for in the Contract Documents, neither the Contractor's Application for Progress Payment shall include, nor shall the District be obligated to disburse any portion of the Contract Price for amounts which the Contractor does not intend to pay any Subcontractor, of any tier, or Material Supplier because of a dispute or any other reason.

838 Title to Work. The Contractor warrants that title to all Work covered by an Application for Progress Payment will pass to the District no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Progress Payment, all Work for which a Progress Payment has been previously issued and the Contractor has received payment from the District therefor shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, stop notices, security interests or encumbrances in favor of the Contractor, Subcontractors, Material Suppliers or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

84 Final Payment.

841 Application for Final Payment. When the Contractor has achieved Final Completion of the Work and has otherwise fully performed its obligations under the Contract Documents, the Contractor shall submit an Application for Final Payment on such form as

approved by the District. Thereupon, the Architect and the District's Inspector will promptly make a final inspection of the Work and when the Architect and the District's Inspector find the Work acceptable under the Contract Documents and that the Contract has been fully performed by the Contractor, the Architect and the District's Inspector will thereupon promptly approve the Application for Final Payment, stating that to the best their knowledge, information and belief, the Work has been completed in accordance with the terms of the Contract Documents. The Final Payment shall include the remaining balance of the Contract Price and any retention from Progress Payments previously withheld by the District.

842 Conditions Precedent to Disbursement of Final Payment. Neither Final Payment nor any remaining Contract Price shall become due until the Contractor submits to the District each and all of the following, the submittal of which are conditions precedent to the District's obligation to disburse the Final Payment: (i) an affidavit or certification by the Contractor that payrolls, bills for materials and other indebtedness incurred in connection with the Work for which the District or the District's property may or might be responsible or encumbered have been paid or otherwise satisfied; (ii) a certificate evidencing that insurance required by the Contract Documents to remain in force after the Contractor's receipt of Final Payment is currently in effect; (iii) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover any period following Final Payment as required by the Contract Documents; if required (iv) consent of the Surety on the Labor and Material Payment Bond and Performance Bond, to Final Payments if required; (v) duly completed and executed forms of Conditional or Unconditional Waivers and Releases of rights upon Final Payment of the Contractor, Subcontractors of any tier and Material Suppliers in accordance with California Civil Code §3262, with each of the same stating that there are, or will be, no claims for additional compensation after disbursement of the Final Payment; (vi) Operations and Maintenance manuals and separate warranties provided by any manufacturer or distributor of any materials or equipment incorporated into the Work; (vii) the Record Drawings; (viii) the form of Guarantee included in the Contract Documents duly executed by an authorized representative of the Contractor; (ix) any and all other items or documents required by the Contract Documents to be delivered to the District upon completion of the Work; and (x) if required by the District, such other data establishing payment or satisfaction of obligations such as receipts, releases and waivers of liens, stop notices, claims, security interest or encumbrances arising out of the Contract to the extent and in such form as may be required by the District.

843 Disbursement of Final Payment. Provided that the District is then in receipt of all documents and other items in Article 8.4.2 above as conditions precedent to the District's obligation to disburse Final Payment, not later than sixty (60) days following Final Acceptance the District shall disburse the Final Payment to the Contractor. Pursuant to California Public Contract Code §7107, if there is any dispute between the District and the Contractor at the time that disbursement of the Final Payment is due, the District may withhold from disbursement of the Final Payment an amount not to exceed one hundred fifty percent (150%) of the amount in dispute.

844 Waiver of Claims. The Contractor's acceptance of the Final Payment is a waiver and release by the Contractor of any and all claims against the District for compensation or otherwise in connection with the Contractor's performance of the Contract.

845 Claims Asserted After Final Payment. Any lien, stop notice or other claim filed or asserted after the Contractor's acceptance of the Final Payment by any Subcontractor, of any tier, laborer, Material Supplier or others in connection with or for Work performed under the Contract Documents shall be the sole and exclusive responsibility of the Contractor who further agrees to indemnify, defend and hold harmless the District and its officers, agents, representatives and employees from and against any claims, demands or judgments arising or associated therewith, including without limitation attorneys fees incurred by the District in connection therewith. In the event any lien, stop notice or other claim of any Subcontractor, Laborer, Material Supplier or others performing Work under the Contract Documents remain unsatisfied after Final Payment is made, Contractor shall refund to District all monies that the District may pay or be compelled to pay in discharging any lien, stop notice or other claim, including, without limitation all costs and reasonable attorneys fees incurred by District in connection therewith.

85 Withholding of Payments. The District may decline to pay the Contractor, or reduce or withhold any portion of a payment otherwise due the Contractor for any Progress Payment or the Final Payment on account of:

- (i) In the District's opinion, the Work cannot be completed for the unpaid balance of the Contract Price;
- (ii) In the District's opinion, the Work will not be completed within the Contract Time and the unpaid balance of the Contract Price would not be adequate to cover liquidated damages resulting from the anticipated delay;
- (iii) Any damage has occurred to the District or any Subcontractor, Material Supplier or another contractor, and the Contractor may be liable for such damage;
- (iv) The Contractor fails to perform any portion of the Work in accordance with the Contract Documents or otherwise violates any provision of the Contract Documents or fails to discharge any Contractor obligation thereunder;
- (v) Any claims, liens, labor compliance withholds, or stop notices are filed in connection with the Work or asserted against the District, the Project or the Site;
- (vi) The Contractor fails to reimburse the District for any costs or expenses incurred by the District, or amounts advanced by the District, on behalf of the Contractor as may be provided or permitted in this Contract;
- (vii) Notification has been given that a penalty will be assessed by any State, local or municipal agency or by the District for violations of any applicable laws, including,

without limitation, tax laws, labor laws and/or fair employment laws;

- (viii) Any current and non-resolved non-compliance notices issued by any public agency;
- (ix) Failure to satisfy any of the requirements of the Labor Compliance Program;
- (x) Defective Work or Work not in conformity with the Contract Documents which is not remedied as required in Article 12 herein;
- (xi) Stop Notices or other liens or third party claims served upon the District as a result of the Contract;
- (xii) Liquidated damages incurred by the District for delays to the Project;
- (xiii) Unsatisfactory prosecution of the Work by the Contractor;
- (xiv) Failure to store and properly secure materials;
- (xv) Failure of the Contractor to submit, on a timely basis, proper, sufficient, and acceptable documentation required by the Contract Documents, including, without limitation, a Construction Schedule, Schedule of Submittals, Schedule of Values, monthly progress schedules, Shop Drawings, Product Data and samples, proposed product lists, executed Change Orders, and/or verified reports;
- (xvi) Failure of the Contractor to maintain Record Drawings;
- (xvii) Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;
- (xviii) Unauthorized deviations from the Contract Documents;
- (xix) Failure of the Contractor to prosecute the Work in a timely manner in compliance with the Construction Schedule, established progress schedules, and/or completion dates;
- (xx) If the District has an LCP in force on this Project, the failure to provide certified payroll records acceptable to the District for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work for the period of the Application for Payment;
- (xxi) Failure to properly pay prevailing wages as defined in Labor Code §§1720 et seq., failure to comply with any other Labor Code requirements, and/or failure to comply with the District's LCP, if one is in force on this Project;

- (xxii) Failure to properly maintain or clean up the Site;
- (xxiii) Failure to indemnify, defend, or hold harmless the District;
- (xxiv) Failure to make payments due to the District, including but not limited to payments for failed tests, utilities changes, or permits;
- (xxv) Failure of the Contractor to make payments when due Subcontractors or Material Suppliers for materials or labor;
- (xxvi) Contractor is otherwise in breach, default, or in substantial violation of any provision of this Contract.

In addition to the foregoing, the District shall not be obligated to process any Application for Progress Payment or Final Payment, nor shall Contractor be entitled to any Progress Payment or Final Payment so long as any lawful or proper direction concerning the Work or the performance thereof or any portion thereof, given by the District, the District's Inspector, the Architect or any public authority having jurisdiction over the Work, or any portion thereof, shall not be fully and completely complied with by the Contractor. When the District is reasonably satisfied that the Contractor has remedied any such deficiency, payment shall be made of the amount withheld. If the District elects to withhold payment from the Contractor pursuant to this Article 8.5, then the District will be permitted to withhold such amounts as the District may, in its reasonable discretion, deem necessary to (A) protect the District against any and all liabilities to Subcontractors, Material Suppliers or any other persons as a result of the Work or any of the Contractor's acts or omissions, (B) correct any defective Work or remedy any breach of the Contract Documents, (C) recover and collect liquidated damages in the event completion of the Project is delayed, (D) recover and collect any costs or expenses paid by, or amounts advanced by, the District on behalf of Contractor, (E) collect any penalty that may be assessed against the Contractor for violations of any applicable laws, including, without limitation, labor laws and/or fair employment laws, and/or (F) recover any testing/inspections costs incurred by the District in connection with failed tests or inspections. The District may apply any such withheld amount or amounts to the payment and satisfaction of such claims or obligations at its discretion. In so doing, the District shall be deemed the agent of Contractor and any payment so made by the District shall be considered as a payment made under the Contract by the District to the Contractor and shall be so deducted from the Contract Price otherwise due the Contractor. The District shall not be liable to Contractor for any such payments made in good faith. Such payments may be made without prior judicial determination of the claim or the obligation to make such payment. The District will render the Contractor a proper accounting of any such amounts retained or disbursed by the District on behalf of the Contractor.

86 Payments to Subcontractors. The Contractor shall pay all Subcontractors for and on account of Work of the Contract performed by such Subcontractors in accordance with the terms of their respective subcontracts and as provided for pursuant to California Public Contract Code

§10262, the provisions of which are deemed incorporated herein by this reference. In the event of the Contractor's failure to make payment to Subcontractors in conformity with California Public Contract Code §10262, the provisions of California Public Contract Code §10253 shall apply; by this reference, the provisions of California Public Contract Code §10253 are incorporated herein in its entirety, except that the references in said Section 10253 to "the director" shall be deemed to refer to the District.

ARTICLE 9: CHANGES

91 Changes in the Work. The District, at any time, by written order, may make Changes within the general scope of the Work under the Contract Documents or issue additional instructions, require additional Work or direct deletion of Work. The Contractor shall not proceed with any Change involving an increase or decrease in the Contract Price or the Contract Time without prior written authorization from the District. The foregoing notwithstanding, the Contractor shall promptly commence and diligently complete any Change to the Work subject to the District's written authorized issued pursuant to the preceding sentence; the Contractor shall not be relieved or excused from its prompt commencement and diligent completion of any Change subject to the District's written authorization by virtue of the absence or inability of the Contractor and the District to agree upon the extent of any adjustment to the Contract Time or the Contract Price on account of such Change. The issuance of a Change Order pursuant to this Article 9 in connection with any Change authorized by the District under this Article 9.1 shall not be deemed a condition precedent to Contractor's obligation to promptly commence and diligently complete any such Change authorized by the District hereunder. The District's right to make Changes shall not invalidate the Contract nor relieve the Contractor of any liability or other obligations under the Contract Documents. Any requirement of notice of Changes in the scope of Work to the Surety shall be the responsibility of the Contractor. Changes to the Work depicted or described in the Drawings or the Specifications shall be subject to approval by the DSA. The District may make Changes to bring the Work or the Project into compliance with environmental requirements or standards established by state or federal statutes and regulations enacted after award of the Contract.

92 Oral Order of Change in the Work. Any oral order, direction, instruction, interpretation, or determination from the District, the District's Inspector or the Architect which in the opinion of the Contractor causes any change to the scope of the Work, or otherwise requires an adjustment to the Contract Price or the Contract Time, shall be treated as a Change only if the Contractor gives the Architect and the District's Inspector written notice within ten (10) days of the order, directions, instructions, interpretation or determination and prior to acting in accordance therewith. Time is of the essence in Contractor's written notice pursuant to the preceding sentence so that the District can promptly investigate and consider alternative measures to address the order, direction, instruction, interpretation or determination giving rise to Contractor's notice. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice within ten (10) days of such order, direction, instruction, interpretation or determination shall be deemed Contractor's waiver of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of such order, direction, instruction, interpretation or determination. The written

notice shall state the date, circumstances, extent of adjustment to the Contract Price or the Contract Time, if any, requested, and the source of the order, directions, instructions, interpretation or determination that the Contractor regards as a Change. Unless the Contractor acts in strict accordance with this procedure, any such order, direction, instruction, interpretation or determination shall not be treated as a Change and the Contractor hereby waives any claim for any adjustment to the Contract Price or the Contract Time on account thereof.

93 Contractor Submittal of Data. Within five (5) days after receipt of a written order directing a Change in the Work or furnishing the written notice regarding any oral order directing a Change in the Work, the Contractor shall submit to the District a detailed written statement setting forth the amount of any adjustment to the Contract Price on account thereof, properly itemized and supported by sufficient substantiating data to permit evaluation of the same, and the extent of adjustment of the Contract Time, if any, required by such Change. No claim or adjustment to the Contract Price or the Contract Time shall be allowed if not asserted by the Contractor in strict conformity herewith or if asserted after Final Payment is made under the Contract Documents.

94 Adjustment to Contract Price and Contract Time on Account of Changes to the Work.

941 Adjustment to Contract Price. Adjustments to the Contract Price due to Changes in the Work shall be determined by application of one of the following methods, in the following order of priority:

941.1 Mutual Agreement. By negotiation and mutual agreement, on a lumpsum basis, between the District and the Contractor on the basis of the estimate of the actual and direct increase or decrease in costs on account of the Change. Upon request of the District, the Contractor shall provide a detailed estimate of increase or decrease in costs directly associated with performance of the Change along with cost breakdowns of the components of the Change and supporting data and documentation. The Contractor shall be solely responsible for any additional costs or additional time arising out of, or related in any manner to, its failure to provide the estimate of costs within five (5) days after the receipt of the written request of the District for such estimate.

941.2 Determination by the District. By the District, whether or not negotiations are initiated pursuant to Article 9.4.1.1 above, based upon actual and necessary costs incurred by the Contractor as determined by the District on the basis of the Contractor's records. In the event that the procedure set forth in this Article 9.4.1.2 is utilized to determine the extent of adjustment to the Contract Price on account of Changes to the Work, promptly upon determining the extent of adjustment to the Contract Price, the District shall notify the Contractor in writing of the same; the Contractor shall be deemed to have accepted the District's determination of the amount of adjustment to the Contract Price on account of a Change to the Work unless Contractor shall notify the District, the Architect and the District's Inspector, in writing, not more than five (5) days from the date of the District's written notice, of any objection to the District's determination. Failure of the Contractor to timely notify the District, the Architect and the District's Inspector of Contractor's objections to the District's determination of the extent of adjustment to the Contract Price shall be deemed Contractor's acceptance of the District's

determination and a waiver of any right or basis of the Contractor to thereafter protest or otherwise object to the District's determination. Notwithstanding any objection of the Contractor to the District's determination of the extent of any adjustment to the Contract Price pursuant to this Article 9.4.1.2, Contractor shall, pursuant to Article 9.7 below, diligently proceed to perform and complete any such Change.

9413 Basis for Adjustment of Contract Price. If Changes in the Work require an adjustment of the Contract Price pursuant to Articles 9.4.1.1 or 9.4.1.2 above, the basis for adjustment of the Contract Price shall be as follows:

94131 Labor. Contractor shall be compensated for the costs of labor actually and directly utilized in the performance of the Change. Such labor costs shall be limited to field labor for which there is a prevailing wage rate classification. Wage rates for labor shall not exceed the prevailing wage rates in the locality of the Site and shall be in the labor classification(s) necessary for the performance of the Change. Use of a labor classification which would increase labor costs associated with any Change shall not be permitted. Labor costs shall exclude costs incurred by the Contractor in preparing estimate(s) of the costs of the Change, in the maintenance of records relating to the costs of the Change, coordination and assembly of materials and information relating to the Change or performance thereof, or the supervision and other overhead and general conditions costs associated with the Change or performance thereof.

94132 Materials and Equipment. Contractor shall be compensated for the costs of materials and equipment necessarily and actually used or consumed in connection with the performance of Changes. Costs of materials and equipment may include reasonable costs of transportation from a source closest to the site of the Work and delivery to the Site. If discounts by Material Suppliers are available for materials necessarily used in the performance of Changes, they shall be credited to the District. If materials and/or equipment necessarily used in the performance of Changes are obtained from a supplier or source owned in whole or in part by the Contractor, compensation therefor shall not exceed the current wholesale price for such materials or equipment. If, in the reasonable opinion of the District, the costs asserted by the Contractor for materials and/or equipment in connection with any Change is excessive, or if the Contractor fails to provide satisfactory evidence of the actual costs of such materials and/or equipment from its supplier or vendor of the same, the costs of such materials and/or equipment and the District's obligation for payment of the same shall be limited to the then lowest wholesale price at which similar materials and/or equipment are available in the quantities required to perform the Change. The District may elect to furnish materials and/or equipment for Changes to the Work, in which event the Contractor shall not be compensated for the costs of furnishing such materials and/or equipment or any mark-up thereon.

94133 Construction Equipment. Contractor shall be compensated for the actual cost of the necessary and direct use of Construction Equipment in the

performance of Changes to the Work. Use of such Construction Equipment in the performance of Changes to the Work shall be compensated in increments of hourly, weekly or monthly rates, whichever shall be the most economical to the District when applied to the scope of the specific change. Rental time for Construction Equipment moved by its own power shall include time required to move such Construction Equipment to the site of the Work from the nearest available rental source of the same. If Construction Equipment is not moved to the Site by its own power, Contractor will be compensated for the loading and transportation costs in lieu of rental time. The foregoing notwithstanding, neither moving time or loading and transportation time shall be allowed if the Construction Equipment is used for performance of any portion of the Work other than Changes to the Work. Unless prior approval in writing is obtained by the Contractor from the Architect, the District's Inspector and the District, no costs or compensation shall be allowed for time while Construction Equipment is inoperative, idle or on standby, for any reason. The Contractor shall not be entitled to an allowance or any other compensation for Construction Equipment or tools used in the performance of Changes to the Work where such Construction Equipment or tools have a replacement value of \$1,000.00 or less. Construction Equipment costs claimed by the Contractor in connection with the performance of any Change to the Work shall not exceed rental rates (Blue Book) established by distributors or construction equipment rental agencies in the locality of the Site; any costs asserted which exceed such rental rates shall not be allowed or paid. Unless otherwise specifically approved in writing by the Architect, the District's Inspector and the District, the allowable rate for the use of Construction Equipment in connection with Changes to the Work shall constitute full compensation to the Contractor for the cost of rental, fuel, power, oil, lubrication, supplies, necessary attachments, repairs or maintenance of any kind, depreciation, storage, insurance, labor (exclusive of labor costs of the Construction Equipment operator), and any all other costs incurred by the Contractor incidental to the use of such Construction Equipment.

94134 Mark-up on Costs of Changes to the Work. In the event a Change adding to the Work is authorized by the District, Contractor shall be paid a mark-up on the direct costs of the Change for general conditions and administration costs, all overhead (including home office and field overhead) and profit, which mark-up shall not exceed the percentage set forth in the Special Conditions, regardless of the number of Subcontractors, of any tier, performing any portion of any Change to the Work. If a Change to the Work reduces the Contract Price, the maximum adjustment to the Contract Price shall be the actual cost reduction realized by the reduced or deleted Work multiplied by the percentage set forth in the Special Conditions.

9414 Contractor Maintenance of Records. In the event that Contractor shall be directed to perform any Changes to the Work pursuant to Article 9.1 or 9.2, or should the Contractor encounter conditions which the Contractor, pursuant to Article 9.6, believes would obligate the District to adjust the Contract Price and/or the Contract Time,

Contractor shall maintain detailed records on a daily basis. Such records shall include without limitation hourly records for labor and Construction Equipment and itemized records of materials and equipment used that day in connection with the performance of any Change to the Work. In the event that more than one Change to the Work is performed by the Contractor in a calendar day, Contractor shall maintain separate records of labor, Construction Equipment, materials and equipment for each such Change. In the event that any Subcontractor, of any tier, shall provide or perform any portion of any Change to the Work, Contractor shall require that each such Subcontractor maintain records in accordance with this Article. Each daily record maintained hereunder shall be signed by Contractor's Superintendent or Contractor's authorized representative; such signature shall be deemed Contractor's representation and warranty that all information contained therein is true, accurate, complete and relate only to the Change referenced therein. All records maintained by a Subcontractor, of any tier, relating to the costs of a Change to the Work shall be signed by such Subcontractor's authorized representative or Superintendent. All records maintained hereunder shall be subject to inspection, review and/or reproduction by the District, the Architect or the District's Inspector upon request. In the event that Contractor shall fail or refuse, for any reason, to maintain or make available for inspection, review and/or reproduction such records and the adjustment to the Contract Price on account of any Change to the Work is determined pursuant to this Article, the District's reasonable good faith determination of the extent of adjustment to the Contract Price on account of such Change shall be final, conclusive, dispositive and binding upon Contractor. Contractor's obligation to maintain records hereunder is in addition to, and not in lieu of, any other Contractor obligation under the Contract Documents with respect to Changes to the Work.

942 Adjustment to Contract Time. In the event of any Change(s) to the Work pursuant to this Article 9, the Contract Time shall be extended or reduced by Change Order for a period of time commensurate with the time reasonably necessary to perform such Change. Such time shall be requested in writing by the Contractor with the Contract price Adjustment Proposal. The time extension request shall be justified by the Contractor by submittal of a CPM analysis accurately portraying the impact of the change on the critical path of the project schedule. Changes performed within available float as indicated in the updated Approved Construction Schedule shall not justify a time extension to the Contract. When agreement is reached between the District and Contractor that a Change shall require an extension of the contract time, the Contractor shall not be subject to Liquidated Damages for such period of time. If completion of the Work is delayed by causes for which the District is responsible and the delay is unreasonable under the circumstances involved, and not within the contemplation of the Contractor and the District at the time of execution of the Agreement, the Contractor shall not be precluded from the recovery of damages arising therefrom.

943 Addition or Deletion of Alternate Bid Item(s). If the Bid for the Work includes proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect, pursuant to this Article to add any such Alternate Bid Item(s) if the same

did not form a basis for award of the Contract or delete any such Alternate Bid Item(s) if the same formed a basis for award of the Contract. If the District elects to add or delete any such Alternate Bid Item(s) pursuant to the foregoing, the cost or credit for such Alternate Bid Item(s) shall be as set forth in the Contractor's Bid.

95 Change Orders. If the District approves of a Change, a written Change Order prepared on behalf of the District shall be forwarded to the Contractor describing the Change and setting forth the adjustment to the Contract Time and the Contract Price, if any, on account of such Change. All Change Orders shall be in full payment and final settlement of all claims for direct, indirect and consequential costs, including without limitation, costs of delays or impacts related to, or arising out of, items covered and affected by the Change Order, as well as any adjustments to the Contract Time. Any claim or item relating to any Change incorporated into a Change Order not presented by the Contractor for inclusion in the Change Order shall be deemed waived. The Contractor shall execute the Change Order prepared pursuant to the foregoing; once the Change Order has been prepared and forwarded to the Contractor for execution, without the prior approval of the District which may be granted or withheld in the sole and exclusive discretion of the District, the Contractor shall not modify or amend the form or content of such Change Order, or any portion thereof. The Contractor's attempted or purported modification or amendment of any such Change Order, without the prior approval of the District, shall not be binding upon the District; any such unapproved modification or amendment to such Change Order shall be null, void and unenforceable. Unless otherwise expressly provided for in the Contract Documents or in the Change Order, any Change Order issued hereunder shall be binding upon the District only upon action of the District's Board of Trustees approving and ratifying such Change Order. In the event of any amendment or modification made by the Contractor to a Change Order for which there is no prior approval by the District, in accordance with the provisions of this Article 9.5, unless otherwise expressly stated in its approval and ratification of such Change Order, any action of the Board of Trustees to approve and ratify such Change Order shall be deemed to be limited to the Change Order as prepared by the Architect; such approval and ratification of such Change Order shall not be deemed the District's approval and ratification of any unapproved amendment or modification by the Contractor to such Change Order.

96 Contractor Notice of Changes. If the Contractor should claim that any instruction, request, the Drawings, the Specifications, action, condition, omission, default, or other situation obligates the District to increase the Contract Price or to extend the Contract Time, the Contractor shall notify the District's Project Manager and the Architect, in writing, of such claim within ten (10) days from the date of its actual or constructive notice of the factual basis supporting the same. The District shall consider any such claim of the Contractor only if sufficient supporting documentation is submitted with the Contractor's notice to the District's Project Manager and the Architect. Time is of the essence in Contractor's written notice pursuant to the preceding sentence so that the District can promptly investigate and consider alternative measures to the address such instruction, request, Drawings, Specifications, action, condition, omission, default or other situation. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice (with sufficient supporting documentation to permit the District's review and evaluation) within ten (10) days of its actual or constructive knowledge of any instruction, request, Drawings, Specifications, action, condition, omission, default or other situation for which the Contractor believes there should an

adjustment of the Contract Time or the Contract Price shall be deemed Contractor's waiver, release, discharge and relinquishment of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of any such instruction, request, Drawings, Specifications, action, condition, omission, default or other situation. In the event that the District determines that the Contract Price or the Contract Time are subject to adjustment based upon the events, circumstances and supporting documentation submitted with the Contractor's written notice under this Article 9.6, any such adjustment shall be determined in accordance with the provisions of Articles 9.4.1 and 9.4.2.

97 Disputed Changes. In the event of any dispute or disagreement between the Contractor and the District or the Architect regarding the characterization of any item as a Change to the Work or as to the appropriate adjustment of the Contract Price or the Contract Time on account thereof, the Contractor shall promptly proceed with the performance of such item of the Work, subject to a subsequent resolution of such dispute or disagreement in accordance with the terms of the Contract Documents. The Contractor's failure or refusal to so proceed with such Work may be deemed to be Contractor's default of a material obligation of the Contractor under the Contract Documents.

98 Emergencies. In an emergency affecting the safety of life, or of the Work, or of property, the Contractor, without special instruction or prior authorization from the District or the Architect, is permitted to act at its discretion to prevent such threatened loss or injury. Any compensation claimed by the Contractor on account of such emergency work shall be submitted and determined in accordance with this Article 9.

99 Minor Changes in the Work. The Architect may order minor Changes in the Work not involving an adjustment in the Contract Price or the Contract Time and not inconsistent with the intent of the Contract Documents. Such Changes shall be effected by written order and shall be binding on the District and the Contractor. The Project Manager or the District's Inspector may direct the Contractor to perform Changes provided that each such Change does not result in an increase of more than \$500.00 to the Contract Price and no adjustment of the Contract Time. The Contractor shall carry out such orders promptly.

9.10 Unauthorized Changes. Any Work beyond the lines and grades shown on the Contract Documents, or any extra Work performed or provided by the Contractor without notice to the Architect and the District's Inspector in the manner and within the time set forth in Articles 9.2 or 9.6 shall be considered unauthorized and at the sole expense of the Contractor. Work so done will not be measured or paid for, no extension to the Contract Time will be granted on account thereof and any such Work may be ordered removed at the Contractor's sole cost and expense. The failure of the District to direct or order removal of such Work shall not constitute acceptance or approval of such Work nor relieve the Contractor from any liability on account thereof.

ARTICLE 10: SEPARATE CONTRACTORS

10.1 District's Right to Award Separate Contracts. The District reserves the right to perform construction or operations related to the Project with the District's own forces or to award separate contracts in connection with other portions of the Project or other construction or operations at or

about the Site. If the Contractor claims that delay or additional cost is involved because of such action by the District, the Contractor shall seek an adjustment to the Contract Price or the Contract Time as provided for in the Contract Documents. Failure of the Contractor to request such an adjustment of the Contract Time or the Contract Price in strict conformity with the provisions of the Contract Documents applicable thereto shall be deemed a waiver of the same.

10.2 District's Coordination of Separate Contractors. The District shall provide for coordination of the activities of the District's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the District in reviewing their respective Construction Schedules when directed to do so. The Contractor shall make any revisions to the Approved Construction Schedule for the Work hereunder deemed necessary after a joint review and mutual agreement. The Construction Schedules shall then constitute the Construction Schedules to be used by the Contractor, separate contractors and the District until subsequently revised.

10.3 Mutual Responsibility. The Contractor shall afford the District and separate contractors reasonable opportunity for storage of their materials and equipment and performance of their activities at the Site and shall connect and coordinate the Contractor's Work, construction and operations with theirs as required by the Contract Documents.

10.4 Discrepancies or Defects. If part of the Contractor's Work depends for proper execution or results upon construction or operations by the District or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Project Manager any apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acknowledgment that the District's or separate contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then discoverable by the Contractor's reasonable diligence.

ARTICLE 11: TESTS AND INSPECTIONS

11.1 Tests; Inspections; Observations.

11.1.1 Contractor's Notice. If the Contract Documents, laws, ordinances or any public authority with jurisdiction over the Work requires the Work, or any portion thereof, to be specially tested, inspected or approved, the Contractor shall give the Project Manager written notice of the readiness of such Work for observation, testing or inspection at least two (2) working days prior to the time for the conducting of such test, inspection or observation. If inspection, testing or observation is by authority other than the District, the Contractor shall inform the District's Inspector and the Project Manager not less than two (2) working days prior to the date fixed for such inspection, test or observation. The Contractor shall not cover up any portion of the Work subject to tests, inspections or observations prior to the completion and satisfaction of the requirements of such test, inspection or observation. In the event that any portion of the Work subject to tests, inspection or approval shall be covered up by Contractor prior to completion and satisfaction of the requirements of such

tests, inspection or approval, Contractor shall be responsible for the uncovering of such portion of the Work as is necessary for performing such tests, inspection or approval without adjustment of the Contract Price or the Contract Time on account thereof.

11.12 Cost of Tests and Inspections. Costs for tests and inspection of materials shall be paid by the District as provided for herein. Within twenty (20) days after the establishment of the Approved Construction Schedule pursuant to Article 7.3 hereof, the District shall submit to the Contractor a written list of the portions of the Work subject to special tests or inspections to be paid for by the District along with the number of hours or costs of testing or inspection allocated for each such portion of the Work. Should any act, omission or other conduct of the Contractor, any of its Subcontractors, of any tier, or Material Suppliers cause the number of hours or the costs of such tests or inspections to exceed that set forth in the District's list submitted pursuant to the foregoing, the Contractor shall be solely responsible for all such excess costs and the District may deduct such amount from any portion of the Contract Price then or thereafter due the Contractor. The District will pay for all tests and inspections provided that, in addition to the cost to be paid by the Contractor previously set forth in this Article, the Contractor shall pay for all tests and inspections under any of the following conditions: (i) when such costs are stipulated in the provisions of the Contract Documents to be borne by the Contractor; (ii) when a material is tested or inspected and fails to meet the requirements of the Specifications and/or Drawings; or (iii) when the source of the material is changed after the original test or inspection has been made or approved.

11.13 Testing/Inspection Laboratory. The District shall select duly qualified person(s) or testing laboratory(ies) to conduct the tests and inspections to be paid for by the District and required by the Contract Documents. All such tests and inspections shall be in conformity with the latest adopted Title 24 of the California Code of Regulations. Where inspection or testing is to be conducted by an independent laboratory or testing agency, materials or samples thereof shall be selected by the laboratory, testing agency, the District's Inspector, the Project Manager or the Architect and not by the Contractor.

11.14 Additional Tests, Inspections and Approvals. If the Architect, the Project Manager, the District's Inspector or public authorities having jurisdiction over the Work determine that portions of the Work require additional testing, inspection or approval, the Project Manager shall instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the District, and the Contractor shall give timely notice to the Project Manager of when and where tests and inspections are to be made so the District's Inspector and the Architect may observe such procedures. The District shall bear the costs of such additional tests, inspections or approvals, except to the extent that such additional tests, inspections or approvals reveal any failure of the Work to comply with the requirements of the Contract Documents, in which case the Contractor shall bear all costs made necessary by such failures, including without limitation, the costs of corrections, repeat tests, inspections or approvals and the costs of the Architect's services or its consultants in connection therewith. Where required DSA testing of the work identifies a failure rate of ten percent (10%) or greater for any system, scope of work, installation or subtrade that has been

specifically targeted, District may, at its sole discretion, order that all such similar systems, installations, scopes of work or subtrade work used in connection with the Project be tested, and the cost to test all such work shall be paid by the Contractor.

11.2 Delivery of Certificates. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect. If a material is not required to be tested, the Architect, Inspector or the District may require Contractor to furnish a certificate bearing the official and legal signature of the supplier with each delivery of such material, which certificate shall state that the material complies with the Specifications.

11.3 Timeliness of Tests, Inspections and Approvals. Tests or inspections required and conducted pursuant to the Contract Documents shall be made or arranged by Contractor to avoid delay in the progress of the Work.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.1 Inspection of the Work.

12.1.1 Access to the Work. All Work and all materials and equipment forming a part of the Work or incorporated into the Work are subject to inspection by the District, the Project Manager, the Architect and the District's Inspector for conformity with the Contract Documents. The Contractor shall, at its cost and without adjustment to the Contract Price or the Contract Time, furnish any facilities necessary for sufficient and safe access to the Work for purposes of inspection by the District, the Project Manager, the Architect, the District's Inspector, DSA or any other public or quasi-public authority with jurisdiction over the Work or any portion thereof.

12.1.2 Limitations Upon Inspections. Inspections, tests, measurements, or other acts of the Architect and the District's Inspector hereunder are for the sole purpose of assisting them in determining that the Work, materials, equipment, progress of the Work, and quantities generally comply and conform with the requirements of the Contract Documents. These acts or functions shall not relieve the Contractor from performing the Work in full compliance with the Contract Documents. No inspection by the Architect or the District's Inspector shall constitute or imply acceptance of Work inspected. Inspection of the Work hereunder is in addition to, and not in lieu of, any other testing, inspections or approvals of the Work required under the Contract Documents.

12.2 Uncovering of Work. If any portion of the Work is covered contrary to the request of the Architect, the District's Inspector, the Project Manager or the requirements of the Contract Documents, it must be uncovered by the Contractor for observation by such District representative and be replaced by the Contractor without adjustment of the Contract Time or the Contract Price.

12.3 Rejection of Work. Prior to the District's Final Acceptance of the Work, any Work or materials or equipment forming a part of the Work or incorporated into the Work which is defective or not in conformity with the Contract Documents may be rejected by the District, the Project

Manager, the Architect or the District's Inspector and the Contractor shall correct such rejected Work without any adjustment to the Contract Price or the Contract Time, even if the Work, materials or equipment have been previously inspected by the Architect or the District's Inspector or even if they failed to observe the defective or non-conforming Work, materials or equipment.

12.4 Correction of Work. The Contractor shall promptly correct any portion of the Work rejected by the District, the Project Manager, the Architect or the District's Inspector for failing to conform to the requirements of the Contract Documents, or which is determined by them to be defective, whether observed before or after Final Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's or Inspector's services and expenses made necessary thereby. The Contractor shall bear all costs of correcting destroyed or damaged construction, whether completed or partially completed, of the District or separate contractors, caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents, or which is defective.

12.5 Removal of Non-Conforming or Defective Work. The Contractor shall, at its sole cost and expense, remove from the Site all portions of the Work which are defective or are not in accordance with the requirements of the Contract Documents which are neither corrected by the Contractor nor accepted by the District.

12.6 Failure of Contractor to Correct Work. If the Contractor fails to commence to correct defective or non-conforming Work within three (3) days of notice of such condition and promptly thereafter complete the same within a reasonable time, the District may correct it in accordance with the Contract Documents. If the Contractor does not so proceed, the District may remove it and store the salvable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage after written notice, the District may sell such materials or equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including without limitation compensation for the Architect's and Inspector's services, attorneys fees and other expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contract Price shall be reduced by the deficiency. If payments of the Contract Price then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor and the Surety shall promptly pay the difference to the District.

12.7 Acceptance of Defective or Non-Conforming Work. The District may, in its sole and exclusive discretion, elect to accept Work which is defective or which is not in accordance with the requirements of the Contract Documents, instead of requiring its removal and correction, in which case the Contract Price shall be reduced as appropriate and equitable.

ARTICLE 13: WARRANTIES

13.1 Workmanship and Materials. The Contractor warrants to the District that all materials and equipment furnished under the Contract Documents shall be new, of good quality and of the most suitable grade and quality for the purpose intended, unless otherwise specified in the Contract

Documents. All Work shall be of good quality, free from faults and defects and in conformity with the requirements of the Contract Documents. If required by the District, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment incorporated into the Work. Any Work, or portion thereof not conforming to these requirements, including substitutions or alternatives not properly approved in accordance with the Contract Documents may be deemed defective. Where there is an approved substitution of, or alternative to, material or equipment specified in the Contract Documents, the Contractor warrants to the District that such installation, construction, material, or equipment will equally perform the function and have the quality of the originally specified material or equipment. The Contractor expressly warrants the merchantability, the fitness for use, and quality of all substitute or alternative items in addition to any warranty given by the manufacturer or supplier of such item.

132 Warranty Work. If, within one year after the date of Final Acceptance, or such other time frame set forth elsewhere in the Contract Documents, any of the Work is found to be defective or not in accordance with the requirements of the Contract Documents, or otherwise contrary to the warranties contained in the Contract Documents, the Contractor shall commence all necessary corrective action not more than seven (7) days after receipt of a written notice from the District to do so, and to thereafter diligently complete the same. In the event that Contractor shall fail or refuse to commence correction of any such item within said seven (7) day period or to diligently prosecute such corrective actions to completion, the District may, without further notice to Contractor, cause such corrective Work to be performed and completed. In such event, Contractor and Contractor's Performance Bond Surety shall be responsible for all costs in connection with such corrective Work, including without limitation, general administrative overhead costs of the District in securing and overseeing such corrective Work. Nothing contained herein shall be construed to establish a period of limitation with respect to any obligation of the Contractor under the Contract Documents. The obligations of the Contractor hereunder shall be in addition to, and not in lieu of, any other obligations imposed by any special guarantee or warranty required by the Contract Documents, guarantees or warranties provided by any manufacturer of any item or equipment forming a part of, or incorporated into the Work, or otherwise recognized, prescribed or imposed by law. Neither the District's Final Acceptance, the making of Final Payment, any provision in Contract Documents, nor the use or occupancy of the Work, in whole or in part, by District shall constitute acceptance of Work not in accordance with the Contract Documents nor relieve the Contractor or the Contractor's Performance Bond Surety from liability with respect to any warranties or responsibility for faulty or defective Work or materials, equipment and workmanship incorporated therein.

133 Guarantee. Upon completion of the Work, Contractor shall execute and deliver to the District the form of Guarantee included within the Contract Documents. The Contractor's execution and delivery of the form of Guarantee is an express condition precedent to any obligation of the District to disburse the Final Payment to the Contractor.

134 Survival of Warranties. The provisions of this Article 13 shall survive the Contractor's completion of Work under the Contract Documents, the District's Final Acceptance or the termination of the Contract.

ARTICLE 14 : SUSPENSION OF WORK

141 District's Right to Suspend Work. The District may, without cause and without invalidating or terminating the Contract, order the Contractor, in writing, to suspend, delay or interrupt the Work in whole or in part for such period of time as the District may determine. The Contractor shall resume and complete the Work suspended by the District in accordance with the District's directive, whether issued at the time of the directive suspending the Work or subsequent thereto.

142 Adjustments to Contract Price and Contract Time. If the District orders a suspension of the Work, an adjustment shall be made to the Contract Price for increases in the direct cost of performance of the Work of the Contract Documents actually caused by suspension, delay or interruption ordered by the District; provided however that no adjustment of the Contract Price shall be made to the extent: (i) that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible under the Contract Documents; or (ii) that an equitable adjustment is made or denied under another provision of the Contract Documents. Any such adjustment of the Contract Price shall not include any adjustment to increase the Contractor's overhead, general administrative costs or profit, all of which will remain as reflected in the Cost Breakdown submitted by the Contractor pursuant to the Contract Documents. In the event of the District's suspension of the Work, the Contract Time shall be equitably adjusted.

ARTICLE 15: TERMINATION

15.1 Termination for Cause.

15.1.1 District's Right to Terminate. The District may terminate the Contract and/or the Contractor's performance of the Contract, in whole or in part, upon the occurrence of any one or more of the following events of the Contractor's default: (i) if the Contractor refuses or fails to prosecute the Work with diligence as will ensure Final Completion of the Work within the Contract Time, or if the Contractor fails to substantially Complete the Work within the Contract Time; (ii) if the Contractor becomes bankrupt or insolvent, or makes a general assignment for the benefit of creditors, or if the Contractor or a third party files a petition to reorganize or for protection under any bankruptcy or similar laws, or if a trustee or receiver is appointed for the Contractor or for any of the Contractor's property on account of the Contractor's insolvency, and the Contractor or its successor in interest does not provide adequate assurance of future performance in accordance with the Contract Documents within 10 days of receipt of a request for such assurance from the District; (iii) if the Contractor repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment; (iv) if the Contractor repeatedly fails to make prompt payments to any Subcontractor, of any tier, or Material Suppliers or others for labor, materials or equipment; (v) if the Contractor disregards laws, ordinances, rules, codes, regulations, orders applicable to the Work or similar requirements of any public entity having jurisdiction over the Work; (iv) if the Contractor disregards proper directives of the Architect, the District's Inspector or District under the Contract Documents; (vii) if the Contractor performs Work which deviates from

the Contract Documents and neglects or refuses to correct such Work; or (viii) if the Contractor otherwise violates in any material way any provisions or requirements of the Contract Documents. Once the District determines that sufficient cause exists to justify the action, the District may terminate the Contract without prejudice to any other right or remedy the District may have, after giving the Contractor and the Surety at least seven (7) days advance written notice of the effective date of termination. The District shall have the sole discretion to permit the Contractor to remedy each cause for the termination without waiving the District's right to terminate the Contract, or otherwise waiving, restricting or limiting any other right or remedy of the District under the Contract Documents or at law.

15.12 District's Rights Upon Termination. In the event that the Contract or the Contractor's performance of the Contract is terminated pursuant to this Article 15.1, the District may take over the Work and prosecute it to completion, pursuant to the Contract or otherwise, and may exclude the Contractor from the site. The District may take possession of the Work and of all of the Contractor's tools, appliances, construction equipment, machinery, materials, and plant which may be on the site of the Work, and use the same to the full extent they could be used by the Contractor without liability to the Contractor. In exercising the District's right to prosecute the completion of the Work, the District may also take possession of all materials and equipment stored at the site of the Work or for which the District has paid the Contractor but which are stored elsewhere, and finish the Work as the District deems expedient. In exercising the District's right to prosecute the completion of the Work, the District shall have the right to exercise its sole discretion as to the manner, methods, and reasonableness of the costs of completing the Work and the District shall not be required to obtain the lowest figure for completion of the Work. In the event that the District takes bids for remedial Work or completion of the Work, the Contractor shall not be eligible for the award of such contract(s).

15.13 Completion by the Surety. In the event that the Contract or the Contractor's performance of the Contract is terminated pursuant to this Article 15.1, the District may demand that the Surety take over and complete the Work. The District may require that in so doing, the Surety not utilize the Contractor in performing and completing the Work. Upon the failure or refusal of the Surety to take over and begin completion of the Work within fifteen (15) days after demand therefor, the District may take over the Work and prosecute it to completion as provided for above. Such remedy is in addition to, and not lieu of, other remedies available to District as provided by law or in equity.

15.14 Assignment and Assumption of Subcontracts. The District shall, in its sole and exclusive discretion, have the option of requiring any Subcontractor or Material Supplier to perform in accordance with its Subcontract or Purchase Order with the Contractor and assign the Subcontract or Purchase Order to the District or such other person or entity selected by the District to complete the Work.

15.15 Costs of Completion. In the event of termination under this Article 15.1, the Contractor shall not be entitled to receive any further payment of the Contract Price until the Work is completed. If the unpaid balance of the Contract Price as of the date of termination

exceeds the District's direct and indirect costs and expenses for completing the Work, including without limitation, attorneys' fees and compensation for additional professional and consultant services, such excess shall be used to pay the Contractor for the cost of the Work performed prior to the effective date of termination with a reasonable allowance for overhead and profit. If the District's costs and expenses to complete the Work exceed the unpaid Contract Price, the Contractor and/or the Surety shall pay the difference to the District.

15.16 Contractor Responsibility for Damages. The Contractor and the Surety shall be liable for all damages sustained by the District resulting from, in any manner, the termination of Contract under this Article 15.1, including without limitation, attorneys' fees, and for all costs necessary for repair and completion of the Work over and beyond the Contract Price.

15.17 Conversion to Termination for Convenience. In the event the Contract is terminated under this Article 15.1, and it is finally determined by an arbitrator, court, jury or other tribunal having jurisdiction, for any reason, that the Contractor was not in default under the provisions hereof or that the District's exercise of its rights under Article 15.1 was defective, deficient, ineffective, invalid or improper for any reason, , the termination shall be deemed a Termination for Convenience of the District and thereupon, the rights and obligations of the District and the Contractor shall be determined in accordance with Article 15.2 hereof.

15.1.8 District's Rights Cumulative. In the event the Contract is terminated pursuant to this Article 15.1, the termination shall not affect or limit any rights or remedies of the District against the Contractor or the Surety. The rights and remedies of the District under this Article 15.1 are in addition to, and not in lieu of, any other rights and remedies provided by law or otherwise under the Contract Documents. Any retention or payment of monies to the Contractor by the District shall not be deemed to release the Contractor or the Surety from any liability hereunder.

15.2 Termination for Convenience of the District. The District may at any time, in its sole and exclusive discretion, by written notice to the Contractor, terminate the Contract or the Contractor's performance of the Contract, in whole or in part, when it is in the interest of, or for the convenience of, the District. In such case, the Contractor shall be entitled to payment for: (i) Work actually performed and in place as of the effective date of such termination for convenience of the District, with a reasonable allowance for profit and overhead on such Work, and (ii) reasonable termination expenses for reasonable protection of Work in place and suitable storage and protection of materials and equipment delivered to the site of the Work but not yet incorporated into the Work, provided that such payments exclusive of termination expenses shall not exceed the total Contract Price as reduced by payments previously made to the Contractor and as further reduced by the value of the Work as not yet completed. The Contractor shall not be entitled to profit and overhead on Work which was not performed as of the effective date of the termination for convenience of the District or for any other damages, direct or indirect, which Contractor or anyone claiming through Contractor alleges resulted from the District's election to terminate under Article 15.2 or where a termination under Article 15.1 has been converted to a termination for convenience under Article 15.1.7. The District may, in its sole discretion, elect to have subcontracts assigned pursuant to Article 15.1.4 above after

exercising the right hereunder to terminate for the District's convenience.

ARTICLE 16: MISCELLANEOUS

161 Governing Law. This Contract shall be governed by and interpreted in accordance with the laws of the State of California.

162 Successors and Assigns. Except as otherwise expressly provided in the Contract Documents, all terms, conditions and covenants of the Contract Documents shall be binding upon, and shall inure to the benefit of the District and the Contractor and their respective heirs, representatives, successors-in-interest and assigns.

163 Cumulative Rights and Remedies; No Waiver. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not in lieu of or otherwise a limitation or restriction of duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the District shall constitute a waiver of a right or remedy afforded it under the Contract Documents or at law nor shall such an action or failure to act constitute approval of or acquiescence in a breach hereunder, except as may be specifically agreed in writing.

164 Severability. In the event any provision of the Contract Documents shall be deemed illegal, invalid, unenforceable and/or void, by a court or any other governmental agency of competent jurisdiction, such provision shall be deemed to be severed and deleted from the Contract Documents, but all remaining provisions hereof, shall in all other respects, continue in full force and effect.

165 No Assignment by Contractor. The Contractor shall not sublet or assign the Contract, or any portion thereof, or any monies due thereunder, without the express prior written consent and approval of the District, which approval may be withheld in the sole and exclusive discretion of the District. The District's approval to such assignment shall be upon such terms and conditions as determined by the District in its sole and exclusive discretion.

166 Independent Contractor Status. In performing its obligations under the Contract Documents, the Contractor is an independent contractor to the District and not an agent or employee of the District.

167 Notices. Except as otherwise expressly provided for in the Contract Documents, all notices which the District or the Contractor may be required, or may desire, to serve on the other, shall be effective only if delivered by personal delivery or by postage prepaid, First Class Certified Return Receipt Requested United States Mail, addressed to the District or the Contractor at their respective address set forth in the Contract Documents, or such other address(es) as either the District or the Contractor may designate from time to time by written notice to the other in conformity with the provisions hereof. In the event of personal delivery, such notices shall be deemed effective upon delivery, provided that such personal delivery requires a signed receipt by the recipient acknowledging delivery of the same. In the event of mailed notices, such notice shall be deemed effective on the third working day after deposit in the mail.

168 Disputes; Continuation of Work. Notwithstanding any claim, dispute or other disagreement between the District and the Contractor regarding performance under the Contract

Documents, the scope of Work thereunder, or any other matter arising out of or related to, in any manner, the Contract Documents, the Contractor shall proceed diligently with performance of the Work in accordance with the District's written direction, pending any final determination or decision regarding any such claim, dispute or disagreement.

16.9 Dispute Resolution; Claims Under \$375,000.00. Claims between the District and the Contractor of \$375,000.00 or less shall be resolved in accordance with the procedures established in Part 3, Chapter 1, Article 1.5 of the California Public Contract Code, §§20104 et seq.; provided however that California Public Contract Code §20104.2(a) shall not supersede the requirements of the Contract Documents with respect to the Contractor's notification to the District of such claim or extend the time for the giving of such notice as provided in the Contract Documents. The term "claims" as used herein shall be as defined in California Public Contract Code §20104(b)(2).

16.10 Attorneys Fees. Except as expressly provided for in the Contract Documents, or authorized by law, neither the District nor the Contractor shall recover from the other any attorneys fees or other costs associated with or arising out of any legal, administrative or other proceedings filed or instituted in connection with or arising out of the Contract Documents or the performance of either the District or the Contractor thereunder.

16.11 Marginal Headings; Interpretation. The titles of the various Articles of these General Conditions and elsewhere in the Contract Documents are used for convenience of reference only and are not intended to, and shall in no way, enlarge or diminish the rights or obligations of the District or the Contractor and shall have no effect upon the construction or interpretation of the Contract Documents. The Contract Documents shall be construed as a whole in accordance with their fair meaning and not strictly for or against the District or the Contractor.

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

16.13 Entire Agreement. The Contract Documents contain the entire agreement and understanding between the District and the Contractor concerning the subject matter hereof, and supersedes and replaces all prior negotiations, proposed agreements or amendments, whether written or oral. No amendment or modification to any provision of the Contract Documents shall be effective or enforceable except by an agreement in writing executed by the District and the Contractor.

END OF SECTION

SECTION 00800

SPECIAL CONDITIONS

PROJECT: AVENAL E.S KINDERGARTEN PROJECT

OWNER: Reef Sunset Unified School District ("District")

JOB NUMBER: Bid ##

SITE LOCATIONS: Avenal Elementary School – 500 South First Avenue, Avenal, CA 93204

1.01 DIVISION OF THE STATE ARCHITECT

The work specified herein **is** subject to the regulation of the Division of the State Architect (DSA).

1.02 Contract Time

- A. Final Completion of the Work.** Final completion of the work shall be achieved within **One hundred Eighty (180) CONSECUTIVE CALENDAR DAYS beginning Monday, January 18, 2020 and ending friday, June 18, 2020.** Failure to achieve Final Completion within the Contract Time will result in the assessment of Liquidated Damages.

1.03 Liquidated Damages.

- A. Delayed Final Completion of the Work.** Pursuant to Article 7 of the General Conditions, the Contractor shall be liable to the District for Liquidated Damages for failure to achieve Final Completion of the Work within the Contract Time as indicated in item 1.02.A, above. **Liquidated Damages shall be at the rate of Five Hundred Dollars (\$500.00) per day until Final Completion of the Work is achieved.**

1.04 Insurance

- A. Insurance Provided by Contractor.** Pursuant to Article 6 of the General Conditions, the Contractor shall provide and maintain the following insurance coverage amounts as set forth below:
- 1. Workers Compensation Insurance**
In accordance with limits established by law.
 - 2. Employers Liability Insurance:** \$1,000,000
 - 3. Commercial General Liability Insurance**

Per Occurrence	\$2,000,000
Aggregate	\$5,000,000

4. **Automobile Liability**
Bodily Injury/Property Damage Per Occurrence \$1,000,000
5. **Excess Products and Completed Operations** \$2,000,000

B. Insurance Provided by Subcontractors.

Pursuant to Article 6 of the General Conditions, all Subcontractors and Sub-Subcontractors shall provide and maintain the following insurance coverages, with minimum coverage amounts as set forth below:

1. **Workers Compensation Insurance**
In accordance with limits established by law.
2. **Employers Liability Insurance** \$1,000,000
3. **Commercial General Liability Insurance**
Per Occurrence \$1,000,000
Aggregate \$2,000,000
4. **Automobile Liability**
Bodily Injury/Property Damage Per Occurrence \$1,000,000

1.05 Number of Contract Documents.

The number of executed copies of the Agreement is Three (3). The number of Performance Bonds and Payment Bonds required is Three (3).

1.06 Security

A. In addition to the security requirements set forth elsewhere in the Contract Documents, the Contractor must adhere to the following:

1. **Keys:** Keys to existing buildings where access is required related to the project may be signed out through the Operations Service Center of the Oxnard School District located at 1055 South C Street in Oxnard between the hours of 7:30AM-4:00PM, Monday through Friday. All keys must be returned and accounted for before final payments will be paid. Contractor will be held responsible for any keys lost, stolen, not returned or signed off. Contractor will bear all costs for re-keying all locks due to keys not returned.
2. **Locked Door Policy:** No building, room or site gate shall be left unsecured for any period of time.

1.07 Working Days and Hours

- A. The workdays** for this contract shall be Monday through Sunday of each week.
- B. The working hours** for this Contract shall be 7:00 a.m. to 8:00 p.m. with a lunch period within midday as required per labor code. These hours are subject to change according to jobsite constraints and restrictions or as deemed necessary by the District. Contractor is expected to work weekends and holidays, as necessary, to complete the work within the specified time of completion without any additional cost to the District. At the District's request, Contractor shall modify the working hours for the Contract without adjustment of the Contract Time or Contract Price. (Reference General Conditions Article 7.2.1). If any work performed during school hours (8:00 a.m. to 3:00 p.m.) is found to be disruptive to the educational process (as determined by the District), the contractor will be required to re-schedule subject work to occur during non-school hours without any additional cost to the District.

1.08 Construction Start Date

- A.** Absolutely no work on this project may commence until all of the following conditions have been met:
 - 1. The Contractor receives the District's written Notice to Proceed.

1.09 Construction Completion Date

Refer to Item No. 1.02.A and Notice to Proceed

1.10 Utilities

Temporary utility connection points for water, sewage, communication/data and electricity shall be provided for and paid for by the Contractor. The Contractor shall furnish all necessary temporary piping and wiring from the connection points to the points on the site where said utilities are necessary to carry on the work and upon completion of the work shall remove such temporary services.

All utilities, including, but not limited to, electricity, water, gas and telephone, used on the work shall be furnished and paid for by Contractor.

If contract is for addition to existing facility, Contractor may, with written permission of the District, use the District's existing utilities by making prearranged payments to the District for utilities used by Contractor for construction.

1.11 Sanitary Facilities and Drinking Water

- A.** The Contractor shall furnish, install, and maintain hand wash and toilet facilities at the site for the workers on this project per OSHA requirements if applicable.
- B.** Drinking water shall be provided at the site by the Contractor for his/her workers.

1.12 Shop Drawings and Field Measurements

Article 4.8 of the General Conditions.

1.13 Submittal Review

Article 4.8 of the General Conditions. The Contractor shall submit Six (6) copies of data for the equipment, materials and supplies required for the work of this contract.

1.14 Wage Rates

- A.** *California State Labor Code.* Reference Article 4.21 of the General Conditions. The Contractor shall comply with all regulations of the California State Labor Code governing work of the nature to be performed under this contract, including but not limited to prevailing wages, working hours, overtime, worker's compensation, travel and subsistence, records, apprenticeship, etc. Prime contractors are responsible for the compliance of this section for all work of their contract. Refer to the Code for full information. Nothing in this contract shall prevent the employment of properly registered apprentices.
- B.** Public works contracts entered into by the Reef Sunset Unified School District may be reviewed by authorized non-profit organizations for prevailing wage compliance at the request of the District or the organization.

1.16 Mark-ups on Changes to the Work.

- A.** In the event of Changes to the Work, the mark-up for all general conditions, costs, overhead (including home and field office overhead) and profit, shall not exceed **Fifteen Percent (15%)** of the direct actual costs of the performance of an additive Change, as determined in accordance with the provisions of Article 9.4 of the General Conditions. In addition, the mark-up shall include the actual, direct cost of the bond for such Change, not to exceed **Two Percent (2%)** of the direct, actual costs of the performance of the Change.

The foregoing limitation or mark-up shall apply regardless of the number of

subcontractors, of any tier, performing any portion of such additive Change to the Work. In the event that the Work of such additive Change is performed in part by a subcontractor, Contractor agrees to allocate at least Ten Percent (10%) to such subcontractor, with no more than Five Percent (5%) to be allocated to the Contractor. In the event the Change is deductive, the District shall receive a credit equal to the value of the direct actual costs of the Work of the deductive Change plus **Ten Percent (10%)** of such direct actual costs for all general conditions, overhead (including home and field office overhead), profit and bond.

1.17 Inclement Weather Days.

Pursuant to Article 7.4.1 of the General Conditions.

1.18 District's Project Manager.

The District's Project Manager is: Scott Burkett, Sr. Vice President, CFW. His office is located at 805 Colorado Blvd., Pasadena CA. Mr. Burkett's phone number is 510-596-8170.

1.19 Asbestos Management

- A.** The District has surveyed its facilities for asbestos and the results have been placed in the "Asbestos Management Plan" for each facility. Each plan includes an operations and maintenance program. Management plans are available for Contractor's review at the District's Facilities Department during normal business hours. It is the Contractor's responsibility to become familiar with the type and location of asbestos containing building materials in the facility by consulting the aforementioned Asbestos Management Plan and to survey the work area for potential asbestos containing materials before starting work. In performing the work, the Contractor will comply with procedures established in the operations and maintenance program and with Federal, State, and Local health and Safety Regulations.
- B.** When the Contractor encounters, damages or disturbs asbestos containing building materials, or materials suspected of containing asbestos, Contractor will avoid taking any action which could cause release or spread of asbestos fibers. The Contractor will immediately stop work and notify the District's project coordinator through the office of the District Director of Facilities, or the District Risk Manager. Work will not be resumed without the consent of the District.

1.20 Hazardous Materials

The terms of this Hazardous Material provision shall survive the completion of the Work and/or any termination of this Contract.

1.21 Hazardous Communication Standard and Material Safety Sheets

A. The Hazard Communication Standard (OSHA 29CFR1910.1200) shall be applicable in this agreement. It designates and requires labeling, Material Safety Data Sheets (MSDS), and employee training for all hazardous materials. The Contractor shall submit, along with other required submittals to the District, Material Safety Data Sheets (MSDS) for all hazardous material to be used or installed by the Contractor, prior to such use or installation. The Contractor shall submit Material Safety Data Sheets (MSDS) on materials and components that are defined or become identified in the specifications for project construction. The Contractor shall make Material Safety Data Sheets available at the site for review by employees and other contractors. Materials commonly used in the construction of school facilities which could require a Material Safety Data Sheet include, but are not limited to, the following:

1. Paints and other coatings
2. Adhesives – floor, wall, furniture, etc.
3. Equipment lubricants – oil, grease, etc.
4. Synthetics of any kind
5. TES coolants
6. Refrigerants
7. Fertilizers
8. Concrete Additives
9. Asphalt paving petroleum additive
10. Transformer coolants
11. Pipe dope
12. PVC/ABS/CPVC solvent
13. No hazardous material shall be used which is harmful in the use of school facilities after construction and occupancy.

1.22 General Notes

A. **Site Access:** All access to the site shall be approved by the School District before any work begins. Contractor shall be responsible for obtaining all parking and encroachment permits and paying all fees. Contractor shall be responsible to patch and repair all damage to existing City curbs, sidewalks, trees, etc., at no additional cost to the School District.

- B. **Student/Bus Drop off Schedule:** Contractor to coordinate all construction traffic with bus schedules including delivery of school supplies and equipment with the School District. The Contractor shall not block driveways or bus areas.
- C. **Delivery of construction equipment** and/or materials shall be scheduled so as not to conflict with the school's operation.
- D. **Dress Code/Language:** Contractors and Subcontractors work crews – Appropriate attire as defined by OSHA and School District standards shall be worn by all work crews at all hours. Clothing with insignias depicting gangs, drugs, sex, profanity, alcohol and/or as deemed offensive to the District are strictly prohibited. NO SHORTS WILL BE ALLOWED. No loud radios or inappropriate language will be tolerated on the site during construction hours. The Contractor must be considerate of the staff and adjoining residences and the adverse impact the aforementioned may cause.
- E. **No Smoking** shall be allowed on School District property.
- F. **On-Site Parking:** No Contractor employee parking will be allowed on site except in designated areas authorized by the School District. District shall not be responsible for any vandalism, damage or theft to employee vehicles.
- G. **Street Parking:** Contractor shall obtain permits for temporary on street parking where required for work force/employee parking.
- H. **Mandatory Pre-Bid Conference:** A mandatory pre-bid conference and job walk will be held as noted in the Notice Inviting Bid and Instruction to Bidders. Bids will not be accepted from Contractors who have not attended the mandatory pre-bid conference and job walk.
- I. **Non-Interference with Other Contractors:** Other Contractors may be working on the project site(s) during time of construction. Contractor must coordinate work with the District and other Contractors.
- J. Contractor will remove all debris from the school sites daily.
- K. District refuse containers **are not** to be utilized by contractor.
- L. The work area is to be maintained in a clean and safe manner at all times.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes, but not limited to the following:
 - 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Work under separate contracts.
 - 4. Owner-furnished products.
 - 5. Contractor-furnished, Owner-installed products.
 - 6. Access to site.
 - 7. Specification and drawing conventions.
 - 8. Miscellaneous provisions.
- B. Related Requirements:
 - 1. Division 1 Section 012100 "Allowances": for purchase contracts.
 - 2. Division 1 Section 015000 "Temporary Facilities" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification:

Avenal E. S. Kindergarten
Reef-Sunset Unified School District
500 South First Ave.
Avenal, CA 93204
- B. Owner:

Reef-Sunset Unified School District
Khai Nguyen
205 N. Park Avenue
Avenal, CA 93204
- C. Owner Rep:

Caldwell Flores Winters Inc (CFW)
Varun Inapuri
6425 Christie Ave,
Emeryville, CA 94608
- D. Architect:

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AP Architects
Jose Vargas
3434 Truxtun Avenue Suite 240,
Bakersfield CA 93301

- E. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

John Borrelli
Electrical Engineer
2032 N. Gateway Blvd.
Fresno, CA 93727-1606

Edward M. Wong, P.E.
Alan Mok Engineering
7415 N. Palm Avenue, Suite 101
Fresno, Ca 93711

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work consists of sitework and associated items for a new Kindergarten Modular building by modular vendor including utilities, etc.
- B. Type of Contract:
1. Project will be constructed under a single prime contract.

1.5 WORK UNDER OTHER CONTRACTS

- A. A separate contract will be issued to AMS Modular Inc. to provide and install a Kindergarten classroom building at the site. Concrete foundation to be provided by this contract. Those operations are scheduled to be completed during the construction operations under this Contract.
1. That Contract includes: AMS Modular Building – see plans.
- B. Owner furnished products:
1. Items indicated on documents.

1.6 WORK SEQUENCE

- A. The Work will be conducted in one phases to provide the least possible interference to the activities of the Owner's personnel and to permit an orderly transfer of personnel and equipment to the new facilities. Project completion is scheduled for specific number calendar days, (refer to Bid Proposal). Contractor shall review scope of work, and provide manpower, resources, etc., as required to complete each phase of project on or before the date required for substantial completion. Contractor shall allow in Proposal weekend workers, shifts of workers and additional productivity not limited to workers, materials, temporary facilities and equipment as required to meet project schedule with limited access times as indicated herein.

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1.7 CONTRACTOR USE OF PREMISES

- A. General: Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.
 - 1. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
 - 2. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
 - 3. When performing new construction on existing sites, become informed and take into specific account the maturity of the students on the site, and perform work which may interfere with educational facility routine before or after facility hours; enclose the work area with a substantial barricade and arrange work to cause a minimum of inconvenience and danger to students and staff in their regular facility activities.

1.8 OWNER OCCUPANCY

- A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.
- B. All work shall be complete and approved prior to occupancy not limited to the following:
 - 1. No portion of building may be occupied requiring impaired Required Fire Detection System unless system is installed and approved.
 - 2. All completed work shall be in compliance with CBC 901.5 and CFC 901.5.1 related to acceptance tests.

1.9 WORK RESTRICTIONS:

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
 - 2. Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor air intakes.
 - 3. Use of controlled substances on the Project site is not permitted.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of **6:00 a.m. to 5:00 p.m.**, Monday through Friday, except as otherwise indicated.
- C. Construction work that generates noise beyond 90db that will disturb adjacent areas shall be scheduled around class schedule and office hours of occupied rooms within 125 feet of work to be done. This work may have to be done during after hours, evenings and Contractor shall verify class schedules when work will generate noise beyond 90db.
- C. Deliver materials to the building area over the route designated by the facility Maintenance and Operations department. Times of deliveries shall coincide not to be done during 5 minutes before class change time between classes and 5 minutes after if said deliveries path is thru any area students will occupy during class change times. If a delivery is overlapping class change times, cease work, provide temporary barricades and resume 5 minutes after classes resume.

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PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not applicable).

END OF SECTION 011000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing handling and processing allowances.
 - 1. Selected materials, services, equipment, related items and in some cases, their installation and related/non-related work are shown and specified in the Contract Documents by allowances herein. Allowances have been established in lieu of additional requirements and to defer selection of actual materials, miscellaneous additional work scope and equipment to a later date when additional information is available for evaluation.
 - 2. Special allowances have been established for unforeseen conditions, latent conditions and related item to be authorized by the Architect for use.
- B. Types of allowances required include the following:
 - 1. Lump sum allowances in Base Bid.
 - 2. Lump sum allowances in Alternate Bid.
- C. Related Requirements:
 - 1. Division 1 Section "Modification Procedures" for procedures for submitting and handling Change Orders.
 - 2. Division 1 Section "Summary of Work" for additional requirements on purchase contracts.

1.3 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to indicate actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.4 ALLOWANCES

- A. Use the allowance only as directed for the Owner's purposes, and only by Supplementary Instructions, which designate amounts to be charged to the allowance.
 - 1. The direct costs for products or equipment ordered by the Owner under the lump sum allowances, including delivery, installation, taxes, and similar costs are part of the allowance. Vendor shall provide insurance as required by the Owner. Contractor shall agree to accept insurance required by Owner for vendor for allowance item. If the contractor requires any special insurance, additional requirements and or bonding of any allowance vendor, contractor shall allow for this cost in his base bid or alternate bid if allowance is tied to an alternate.

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- a. In the event the work under allowance cannot be completed during the duration of the project as prescribed under "Project Summary", contractor may elect to request additional extended overhead. Extended overhead will be determined by actual costs incurred by contractor specific to this project and verified by project schedule.
2. Supplementary Instructions (SI) authorizing use of funds from the lump sum allowance will not include the Contractor's related costs and reasonable overhead, supervision, profit margins and other related costs as these costs are already in the contractor's proposal/bid.
3. If any individual allowance contains surplus funds or contains deficient funds, Architect may transfer funds between allowances as necessary.
4. At Project closeout, credit unused amounts remaining in the allowance to Owner by Negative Change Order amount for unused amounts.
5. The contractor shall include in his base bid all overhead, profit, supervision, bonds, insurance and all other indirect costs for allowance items. None of these items will be added to lump sum and miscellaneous allowance as it is used by the Owner and directed by the architect. In the event the allowance is required in an Alternate, the contractor shall include in his alternate bid all overhead, profit, supervision, bonds, insurance and all other indirect costs for allowance items specific to that alternate.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect products covered by an allowance promptly upon delivery for damage or defects.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related construction activities.
- B. Coordinate scheduling of Owner selected Vendors. Obtain availability schedules from Vendors early in project to coordinate timing of special milestones and products necessary for implementation into overall construction activities.

3.3 SCHEDULE OF BASE BID ALLOWANCES

- A. Allowance No. 1: Include a lump sum allowance of \$40,000.00 for use upon the Architect's instructions.

END OF SECTION 012100

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for Alternates.
- B. Definition: An Alternate is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the Bidding Requirements that may be added to the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents. See each alternate in schedule of alternates below for construction duration impacts if any.
 - 1. Where items or portions of items are added or removed to the Base Bid by alternate, it shall be the responsibility of the Contractor to allow for any reduction or additional material or labor which may be required to finish items not so removed, thereby providing a complete and finished condition matching that of similar conditions which are a part of the Contract.
 - a. Add: Where alternates are noted as Add, Contractor shall allow for work indicated to be in alternate cost and shall be the amount that Base Bid would be increased.
 - 2. A bidder's un-awarded alternative bids remain open for a period of 180 calendar after award of contract or acceptance of completed project, whichever come first, as irrevocable offers to enter into either change orders or separate contracts for the stated price adjustment.
 - 3. The Construction time allotted for this project shall not be changed by the acceptance of any alternate unless indicated in the Alternate Schedule herein.
- C. Coordination: Contractor to coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the project.
 - 1. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 2. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
 - 3. Refer to Allowance Section where Alternates are affected by Allowances.

1.3 SCHEDULE OF ALTERNATES:

- A. Alternate No. 1 (Add): Electrical and Communications Service:
 - 1. Electrical, Communication and Signal service as shown on Electrical Site Plan E2.1 and E2.2 on Addendum 01. Point of connection to Pull Box "PB-CS. P1, S2".

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2. Base Bid: Omit work shown on Sheet E2.1 (Addendum 01). Electrical, Communication and Signal service as shown Sheet E2.2 (Addendum 01) from building to Pull Box "PB-CS, P1, S2".
 3. Project duration: No change if alternate accepted.
- B. Alternate No. 2 (Add): Paving:
1. Concrete Paving as shown A1.20 Partial Site Plan.
 2. Base Bid: Asphalt Paving where indicated to be concrete paving on A1.20. Refer to Detail "F/C4" for paving section. Provide concrete curb at perimeter of Synthetic Turf.

1.4 NOTIFICATION:

- A. Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.
1. Owner may defer the award of any alternates, refer to supplemental conditions and herein.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 012300

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification sections, apply to this section.

1.2 SUMMARY

- A. This section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK and REQUEST FOR INFORMATION (RFI)

- A. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect. The Architect may issue written Supplemental Instructions, (SI), which interpret the Contract Documents or which order minor changes in the work without change in Contract sum or Contract time. The Contractor shall carry out such Supplemental Instructions promptly.
 - 1. Unless otherwise noted, SI, (Supplemental Instructions) does not warrant a cost or time impact to the Contract cost or time. If Contractor does not agree, Contractor has 10 calendar days from date of receipt of SI to file a claim for adjustment in writing to the architect.
 - 2. The Architect shall use SI's for written order for usage of allowance funds for project if any allowances are indicated.
- B. Contractor shall be able to ask valid questions concerning items required to construct project. This shall be done by the following methods in order as follows: (1) Contractor to review plans and determine if information is prescribed therein; (2) Contractor to review question with Project Inspector and determine if information is indicated, intended and/or prescribed in construction documents; (3) Contractor place an informal inquiry with architect and discuss question: and if no answer is determined then (4) Contractor shall prepare a Request for Information (RFI) and deliver to architect for determination of answer and or direction from architect as prescribed herein.
 - 1. Contractor shall submit Request for Information (RFI) on enclosed form at end of this Section.
 - 2. Contractor shall attach to RFI what they consider to be answer to Request for Information. Failure to provide this information shall be grounds for Architect to Request for Clarification.
 - 3. An RFI is defined as a request for information for information that cannot be found in the construction documents and related submittals. Items not considered RFI's are as follows:
 - a. A request for a proposed alternative materials, products or colors.
 - b. Substitutions.
 - c. Coordination of Contractor changed/initiated field conditions.

1.4 CHANGES IN WORK

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- A. The Owner, without invalidating the Contract may make changes by altering, adding to, or deducting from the work, the Contract sum and construction duration being adjusted accordingly. All such work shall be executed under the conditions of the original contract. Unless so authorized, the Contractor shall not deviate from nor alter the work as shown on the drawings or specifications. Additional work may be added to project by using project allowances as prescribed herein.
 - 1. In the event additional work is added to the project via allowances the Contractor shall provide an analysis of the schedule impact if any. If additional work is shown to impact the construction schedule the Contractor shall be entitled additional time as agreed to by architect. If additional work is shown by schedule analysis to have no impact, no additional construction duration will added to project.
 - 2. Any changes in construction duration shall be documented by a Change Order to Contract.
- B. If Contractor should claim that any instruction, request, drawing, specification, action, condition, omission, default, or other situation constitutes a change, extra work, or otherwise obligates Owner to pay additional compensation to Contractor or to grant an extension of time, or constitutes a waiver of any provision in the Contract Documents, Contractor shall notify Owner in writing of such claim within ten calendar days from the date Contractor has actual or constructive notice of the factual basis supporting the claim. The notice shall state the factual basis for the claim and cite in detail the Contract Documents (including plans and specifications) upon which the claim is based. Contractor's failure to notify Owner and Architect within the ten-day period shall be deemed a waiver and relinquishment of such a claim. If the notice is given within the specified time, the procedure for its consideration shall be as stated in these General Conditions. In the event of failure to agree, the matter shall be treated as a claim following the claims procedures in the Contract Documents.
- C. No change shall be made without such authorization, signed by the Owner, and countersigned by the Architect, or signed by the Architect and stating that the Owner has authorized such changes.
 - 1. Refer to Supplementary Conditions for Construction Change Directive (CCD) procedures.
 - 2. Refer to Supplementary Conditions for Supplemental Instructions (SI) procedures.
- D. Any changes processed by the Contractor or any work performed not in conformance with these plans and specifications which requires extra drawing, specifications, calculations, inspections and any other work by the Architect and/or Engineers shall be paid for by the Contractor. Payment shall be made to the Architect at current hourly rate on file due and payable upon presentation of invoice.

1.5 CHANGE ORDER PROCESS-(OWNER AND CONTRACTOR INITIATED PROPOSAL REQUEST, AND ALLOWANCES.)

- A. Owner-Initiated Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
 - 1. Request for Proposal requests (RFP), issued by the Architect are for information only. Do not consider them an instruction either to stop work in progress, or to execute the proposed change.
 - 2. Unless otherwise indicated in the proposal request, within 20 calendar days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change as well as Construction Duration impact.
 - a. Include a list of quantities of products to be purchased and unit costs, along with the

- total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Duration.
 - d. Before Contractor is authorized to proceed with extra work or changes on the basis set forth above, the Owner and the Contractor shall be in complete agreement on what the term "costs" shall include and the amount of overhead and profit the Contractor is to charge.
 - e. All unit prices, whether set forth in the Contract or subsequently agreed upon, shall include overhead, profit, supervision, increased premium on all Bonds, increased premium on all insurances and other indirect cost for all tiers of contractors and related material men unless said items are being paid thru an allowance where overhead, profit, supervision, bonds, insurance and related items are included in contractor's base bid.
 - f. If there has been no response within 20 calendar days to an Architect's Request for Proposal, the Architect may direct the change to be done Time and Material. Under no circumstance may the contractor increase cost or increase schedule time due to Owner not receiving proposal timely.
- B. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
 - 1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 - 2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Comply with requirements in Supplementary Conditions Article 15 Substitutions if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
 - 5. Claim submitted to the Architect for extensions of time and extra cost shall be made on forms carrying Contractor's letterhead and shall contain a complete breakdown of all costs and extension of Surety Bonds and Insurance impacts.
 - 6. Before Contractor is authorized to proceed with extra work or changes on the basis set forth above, the Owner and the Contractor shall be in complete agreement on what the term "costs" shall include and the amount of overhead and profit the Contractor is to charge as any Contract Duration impacts.
- C. All CCDs to be submitted to DSA per IR A-6.
- D. For changes that increase or decrease the contract price, or being paid by allowance item, the Contractor shall include the following amounts for overhead and profit:
 - 1. Contractor's overhead and profit on the cost of work excluding work by Contractor shall be a total sum not exceeding ten percent (10%) of cost of such work. (See below for allowances)
 - 2. Contractor's overhead and profit on the cost of work performed by contractor without subcontractor shall be a total sum not exceeding ten percent (10%) of the cost of labor, materials, rentals, etc. (See below for allowances)
 - 3. Subcontractor's overhead and profit on the cost of work performed by subcontractor shall

- be a total sum not exceeding ten percent (10%) of the cost of labor, materials, rentals, etc.
4. Subcontractor's overhead and profit on the cost of work performed by sub-contractors (one lower tier) shall be a total sum not exceeding five percent (5%) of such work.
 5. Allowances: The contractor shall include in his base bid all overhead, profit, supervision, bonds, insurance and all other indirect costs for allowance items. None of these items will be added to lump sum and miscellaneous allowance as it is used by the Owner and directed by the Architect. In the event the allowance is required in an Alternate, the Contractor shall include in his alternate bid all overhead, profit, supervision, bonds, insurance and all other indirect costs for allowance items specific to that alternate.
- E. Time and Material basis as changes in the work. For changes that increase the contract price and work is authorized based upon the cost of labor, material, equipment and subcontract prices, plus a percentage for overhead and profit the following requirements shall apply. In the event the costs for changes in the work are not agreed to by the Architect and Contractor the work may be authorized to move forward on a time and material basis. If a Time and Material basis is used and scope of work is being paid thru an allowance overhead and profit are to be included in base bid and alternates where occur.
1. Daily reports by Contractor, as follows:
 - a. General. At the close of each working day, Contractor shall submit a daily report to the Architect and the Project Inspector on forms approved by Owner, together with applicable delivery tickets listing all labor, materials, and equipment involved for that day, and for other services and expenditures, when authorized, concerning extra work items. An attempt shall be made to reconcile the report daily, and it shall be signed by the Architect and Contractor. In the event of disagreement, pertinent notes shall be entered by each party to explain points which cannot be resolved immediately. Each party shall retain a signed copy of the report. Reports by subcontractors or others shall be submitted through Contractor.
 - b. Labor. The report shall show names of workers, classifications, and hours worked and hourly rate. Project supervision expenses, including for foremen and above, are not allowed. (iii) Materials. The report shall describe and list quantities of materials used and unit cost.
 - c. Equipment. The report shall show the type of equipment, size, identification number, and hours of operation, including loading and transportation, if applicable, and hourly/daily costs.
 - d. Other Services and Expenditures. Other services and expenditures shall be described in such detail as Owner may require.
 2. Basis for Establishing Costs
 - a. Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft classification or type of worker at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from federal, state, or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. The use of labor classifications which would increase the extra work cost will not be permitted unless Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.
 - b. Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available and delivered to the work site in the quantities involved, plus sales tax, freight, and delivery. Owner reserves the right to approve materials and sources of supply, or to supply materials to Contractor if necessary for the progress of the work. No markup shall be applied to any material

- provided by the Owner.
- c. Tool and Equipment Rental. No payment will be made for the use of tools which have a replacement value of \$100 or less or where an invoice is not provided. Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed listed rates prevailing locally at equipment rental sources or distributors at the time the work is performed. The rental rates paid shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Necessary loading and transportation costs for equipment used on the extra work shall be included. If equipment is used intermittently, and when not in use could be returned to its rental source at less expense to Owner than holding it at the work site, it shall be returned, unless Contractor elects to keep it at the work site at no expense to Owner. All equipment shall be acceptable to the Architect in good working condition, and suitable for the purpose for which it is to be used. Manufacturer's ratings and manufacturer's approved modifications shall be used to classify equipment and it shall be powered by a unit of at least the minimum rating recommended by the manufacturer.
 - d. Other Items. Owner may authorize other items which may be required on the extra work. These items include labor, services, material, and equipment which are different in their nature from those required by the work and which are of a type not ordinarily available from Contractor any of the Subcontractors. Detailed invoices covering all such items shall be submitted with the request for payment. (v) Invoices. Vendors' invoices for material, equipment rental, and other expenditures shall be submitted with the request for payment. If the request for payment is not substantiated by invoices or other documentation, Owner may establish the cost of the item involved at the lowest price which was current at the time of the report.
3. Daily worker time sheets shall be approved by the Project Inspector as well as copies of all materials invoices delivered to project site for this specific change. Time sheets and copies of all material costs shall be provided with pay request for this specific change with daily approvals by Project Inspector
- F. The following form shall be used by Contractor as applicable to communicate proposed additions and deductions to the Contract Documents and use of allowances:

#	Description	Extra	Credit
a	Materials (attached itemized quantity and unit costs including any sales tax.	_____	_____
b	Labor (attached itemized hours and rates)	_____	_____
c	\$ Subtotal	_____	_____
d	Subcontractor's overhead and profit on the cost of work performed by sub-contractors (one lower tier) shall be a total sum not exceeding five percent (5%) of such work.	_____	_____
e	\$ Subtotal	_____	_____
f	Subcontractor's overhead and profit on the cost of work performed by subcontractor shall be a total sum not exceeding ten percent (10%) of the cost of labor, materials, rentals, etc.	_____	_____
g	\$ Subtotal	_____	_____

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- h Contractor's overhead and profit on the cost of work excluding work by Contractor shall be a total sum not exceeding ten percent (10%) of cost of such work.

(Refer to project manual "Allowances" where overhead and profit are included in base bid and alternates where occur)

- i Contractor's overhead and profit on the cost of work performed by contractor without subcontractor shall be a total sum not exceeding ten percent (10%) of the cost of labor, materials, rentals, etc. .

(Refer to project manual "Allowances" where overhead and profit are included in base bid and alternates where occur)

- j Bond Premium (Submit invoice from Bonding provider) .

(Refer to project manual "Allowances" where bond premium are included in base bid and alternates where occur)

- k Insurance (Submit invoice from Insurance provider)
(Refer to project manual "Allowances" where bonds and insurance are included in base bid and alternates where occur)

l \$ Total

- m Number of additional days time extension requested due to this time and material change. (Submit as built critical path schedule validating time extension for review and approval)

Total Days

Subcontractor's labor, material, overhead and profit shall be submitted with documentation in original form as submitted to General Contractor.

(Refer to project manual "Allowances" where overhead and profit are included in base bid and alternates where occur)

- G. It is expressly understood that the value of such extra work or changes as determined by any of the methods herein expressly includes any and all of the contractors' costs and expense, both direct and indirect, resulting from delays or additional time required on the project, or resulting from accelerated work to avoid delays to the project.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 012600

DATE:	RFI #
--------------	--------------

ATTN:	Jose Vargas	PROJECT:	Avenal E.S. Kindergarten
	3434 Truxtun Avenue Ste 240		Avenal Elementary School
	Bakersfield CA 93301		Reef Sunset Unified School District
		PROJECT#:	394-0010

Subject: _____ Section #: _____

Sheet #: _____

Description:

[illegible]

☐ Clarification ☐ Unforeseen Condition ☐ Owner Change ☐ Others

Requesting Sponsor: _____ Approved by: _____

Total number of pages: Contractor:

☐ RFI has been reviewed with Project Inspector without resolution

The Architect has 15 business days after written request is received to respond to Request for Information. No delay will be recognized on account of failure of Architect to furnish such interpretations within that period. Partial response or request for clarification of Request for Information constitutes response by Architect. Claims for adjustment shall be made within 10 calendar days after occurrence of the event giving rise to such claim in writing. Date received at Architect's office of signed original claim shall constitute date received. Architect shall be reimbursed by Contractor for time at current hourly rates prevailing to respond to Request for Information that are found to be substantially answered in Construction Documents.

ARCHITECT'S RESPONSE:

☐ RFI not valid ☐ RFI valid

Issued RFI Response #:

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Divisions 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
 - 1. Coordination.
 - 2. Administrative and supervisory personnel.
 - 3. General installation provisions.
 - 4. Cleaning and protection.
 - 5. Coordination of allowance items and impacts with base bid scope of work.
 - 6. Coordination of alternate(s) scope of work and impacts with base bid scope of work.
- B. Progress meetings, coordination meetings and pre-installation conferences are included in Section "Project Meetings".
- C. Requirements for the Contractor's Construction Schedule are included in Division 1, Section "Submittals" and Division 1 Section "Progress Schedules and Reports".

1.3 COORDINATION

- A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
 - 1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
 - 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
 - 1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

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1. Preparation of schedules.
 2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Project Close-out activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials provided by Owner.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision. Confirm all handicapped mounting heights are in compliance with Title 24 prior to any rough-in work.

3.2 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at final acceptance.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION 013000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
 - 1. Pre-Construction Conference.
 - 2. Pre-Installation Conferences.
 - 3. Progress Meetings.
 - 4. Project Coordination Meetings.
- B. Related sections include the following construction schedules are specified in another Division-1 Section.
 - 1. Division 1 Section "Submittals" for construction schedules and related items.
 - 2. Division 1 Section "Progress Schedule and Reports" for construction schedules.

1.3 PRE-CONSTRUCTION CONFERENCE

- A. Schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than 15 days after Notice to Proceed and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: The Owner, Architect, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.
- C. Agenda: Discuss items of significance that could affect progress including such topics as:
 - 1. Tentative construction schedule.
 - 2. Critical Work sequencing.
 - 3. Designation of responsible personnel.
 - 4. Procedures for processing field decisions and Change Orders.
 - 5. Procedures for processing Applications for Payment.
 - 6. Distribution of Contract Documents.
 - 7. Submittal of Shop Drawings, Product Data and Samples.
 - 8. Preparation of record documents.
 - 9. Use of the premises.
 - 10. Office, Work and storage areas.
 - 11. Equipment deliveries and priorities.
 - 12. Safety procedures.
 - 13. First aid.
 - 14. Security.

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15. Housekeeping.
16. Working hours.

1.4 PRE-INSTALLATION CONFERENCES

- A. Conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect of scheduled meeting dates.
 1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
 - a. Contract Documents.
 - b. Deliveries.
 - c. Shop Drawings, Product Data and quality control Samples.
 - d. Possible conflicts.
 - e. Compatibility problems.
 - f. Time schedules.
 - g. Weather limitations.
 - h. Manufacturer's recommendations.
 - i. Compatibility of materials.
 - j. Acceptability of substrates.
 - k. Temporary facilities.
 - l. Space and access limitations.
 - m. Governing regulations.
 - n. Safety.
 - o. Inspection and testing requirements.
 - p. Required performance results.
 - q. Protection.
 2. Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.
 3. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

1.5 PROGRESS MEETINGS

- A. Conduct progress meetings at the Project site at periodic scheduled intervals. Coordinate schedules with the Owner and Architect of proposed meeting dates in advance of meetings. Discuss at Pre-construction meeting. Coordinate dates of meetings with preparation of the payment request such Architect and Project Inspector can discuss any issue with Contractor on project site.
- B. Attendees: In addition to representatives of the Owner and Architect, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

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1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 2. Review the present and future needs of each entity present, including such items as:
 - a. Interface requirements.
 - b. Time.
 - c. Sequences.
 - d. Deliveries.
 - e. Off-site fabrication problems.
 - f. Access.
 - g. Site utilization.
 - h. Temporary facilities and services.
 - i. Hours of Work.
 - j. Hazards and risks.
 - k. Housekeeping.
 - l. Quality and Work standards.
 - m. Safety of Students and Staff.
 - n. Documentation of information for payment requests.
- D. Reporting: No later than 3 business days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
1. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.
 2. Send Architect, Construction Manager, Project Inspector, and Owner digital files of meeting report and revised schedules.
 3. Architect shall provide a copy of field report made during visit to Contractor within 10 days of site visit.

1.6 PROJECT COORDINATION MEETINGS

- A. Conduct coordination meetings at the site before each construction activity that requires coordination with other construction. The various Contractors involved in or affected by the installation, and its coordination or integration with other materials and installations shall attend the meeting. Advise the Architect of scheduled meeting dates.
- b. Site/Building Utilities Contractors: The following Contractors shall attend the coordination construction activities and space requirements:
 - 1) All Site/Building Utilities Systems.
 - 2) All Site/Building Electrical Systems.
 - 3) All Site/Building Data Cabling Systems.
 - 4) Other Site/Building Systems.
 1. Record significant discussions and agreements and disagreements of each meeting, along with the approved coordination drawings. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.

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2. Do not proceed if the coordination meeting cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the coordination meeting at the earliest feasible date.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 013100

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including, but not limited to;
 - 1. Contractor's construction project schedule.
 - 2. List of products/manufacturers.
 - 3. Shop Drawings.
 - 4. Product Data.
 - 5. Samples.
 - 6. Miscellaneous Submittals.
 - 7. Construction Schedule and updates required for each payment request.
 - 8. Coordination Drawings, specified in Division 1 Section "Project Coordination".
 - 9. Test reports.
- B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
 - 1. Permits/Public Works.
 - 2. Applications for payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of Subcontractors.
 - 6. Schedule of Values.
 - 7. DSA Verified Reports.
 - 8. Electronic certified payroll records directly to the Labor Commissioner.
 - 9. Preliminary notices (20-day notice).
 - 10. Procedures for substitutions.
- C. Inspection and test reports are included in Section "Quality Control Services."
- D. Other submittals:
 - 1. See Division 1 Section "Governing Agency" for DSA Verified Reports to be filed.
 - 2. See Division 1 Section "Project Schedule and Reports," for additional schedule and report requirements

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

- a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 - b. No color selections will be made until all color samples for entire project have been received by the Architect and determined to be acceptable.
3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals.
 - a. Allow three weeks for initial review (21 calendar days). Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.
 - c. Allow two weeks (14 calendar days) for reprocessing each submittal.
 - d. No extension of Contract Time or claims for additional costs will be approved or authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work and Critical Path Schedule to permit processing requirements indicated herein. Submittals covering component items and forming an interrelated system of items must be coordinated and submitted concurrently rather than individual submittals for review.
 - e. Time is defined as calendar days, starting from date item is received in architect's office and end with date of transmittal to General Contractor as last day of review.
 - 1) Where Submittal is required to be reviewed by consulting Engineer, time to review will be increased by seven (7) calendar days for review.
 - 2) Where Submittal is required to be reviewed by two parties--i.e., Architect-Engineer, Engineer-Engineer--add fourteen (14) calendar days for review.
 - 3) The Architects' office is closed from December 16 through January 2 of each calendar year. Submittals received less than 21 calendar days before office closing may not be processed before office closed dates noted herein. The balance of the 21 calendar days will resume after January 2 of each closing for submittals and related items. It is the contractor's responsibility to have critical submittals received by the architect 21 calendar days prior to above closing for timely processing.
 - a). Consulting engineering related submittals and re-review items will add time as indicated herein above to the amount of time indicated due to office closing.
 - f. Shop drawings, submittals and related items shall be submitted at a time sufficiently early to allow review by the Architect and the Division of State Architect (DSA) if required, and to accommodate the rate of construction progress required under the Contract Documents. Contractor will be required to pay the Architect's reasonable and customary fees to expedite review of shop drawings which are not submitted in timely fashion.
 - g. Contractor shall have no claim for damages or extension of time due to any delay resulting from contractor having to make required revisions to shop drawings unless the Architect's review of the drawings is delayed beyond the time provided in the contract documents and contractor can establish that the Architect's delay in review actually resulted in a delay in Contractor's construction schedule. Contractor shall provide a record as built schedule as proof of delays within 10 days of the event that gives rise to a delay claim. Contractor shall not be entitled to any claim for damages resulting from DSA review beyond days allowed herein documents after submittal. However, owner may consider an extension of time due to any delay caused by DSA review.
4. All submittals shall be cross-referenced to contract documents to expedite checking. Use Project Manual's section designation and Working Drawing's sheet number(s).

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- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Provide a space approximately 4" x 4" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken. Provide on the label or beside the title block on Shop Drawings to record the Architect's review and approval markings and the action taken.
 2. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
 3. Submittals shall be stamped and signed by the Prime Contractor to the effect that the contents have been reviewed and approved by him and meet the requirements for this project. Submittals will not be reviewed without this approval by Prime Contractor. Contractor's review and approval of shop drawings shall include the following stamp:
 - a. "Contractor has reviewed and approved not only the field dimensions but the construction criteria and has also made written notation regarding any information in the shop drawings that does not conform to the Contract Documents. This shop drawing has been coordinated with all other shop drawings received to date by Contractor and this duty of coordination has not been delegated to subcontractors, material suppliers, the Architect, or the engineers on this Project.

Signature of Contractor"
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.
1. On the transmittal record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
- D. Failure to provide adequate and correct submittals: Contractor shall make a complete and acceptable submittal to the Architect by the second submission of submittals. Owner shall withhold funds due to Contractor to cover additional costs of the Architect's review beyond the second submission and any other costs incurred by Owner.
1. Architect shall be reimbursed for all time spent in reviewing and processing of re-submittals of any submittals after the second submission where items have not been addressed, corrected and/or providing a complete submittal as requested by architect in previous submissions of a submittal.
- E. Submittal quantities:
1. Provide seven (7) copies of all submittals except as follows:
 - a. Shop Drawings: Provide 4 copies of shop drawings. Architect and Engineer will red line any corrections and retain 4 copies. Contractor will be sent a PDF file of black and white scanned shop drawing for distribution and printing by Contractor. In the event of corrections and resubmittal contractor shall send 4 corrected copies of Shop

Drawings at each resubmittal.

1.4 CONTRACTOR'S CONSTRUCTION PROJECT SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type Contractor's construction project schedule. Identify critical path items throughout project schedule. Submit within 15 days of the award of contract.
1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".
 2. Within each time bar indicate estimated completion percentage in maximum 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
 3. Prepare the schedule on a sheet, or series of sheets of sufficient width to show data for the entire construction period.
 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the project schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.
 5. Coordinate the Contractor's construction project schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.
 6. Indicate completion in advance of the date established for Final Completion. Indicate Final Completion on the schedule to allow time for the Architect's procedures necessary for certification of Final Completion.
- B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by requirements for phased completion to permit Work by separate Contractors, partial occupancy by the Owner prior to Final Completion.
- C. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.
- D. Weather Delays: Contractor shall show anticipated rain, sleet, snow, wind and other weather driven delays on initial project schedule, as separate line items for each weather delay type, based upon Contractor's proposed ways and means. Refer to Project Manual herein for additional requirements.
- E. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.
- F. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
- G. Submit with each payment request an updated construction project schedule with the above item plus the following items:
1. As-built project schedule of work performed to date.
 2. Adjusted project schedule showing schedule to complete work.
 3. Number of weather delay days and audit of days used for each type of weather delay.
 4. Updated Final Completion project schedule dates.

1.5 LIST OF PRODUCTS/MANUFACTURES

- A. Not later than 35 days from the date of the notice to proceed and prior to installation of items,

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whichever is less, the Contractor shall provide a list showing the name of the manufacturer proposed to be used for each of the products, proposed for installation, and not specified or named in the contract documents including the name of manufacturer of each, for review by the Owner and Architect. The list shall be tabulated by, and be complete for each specification section. Where applicable, subcontractor's names shall be included in such list.

1.5 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
- B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, shop work manufacturing instructions, coordination drawings (for on-site use), design mix information, contractor's engineer calculations, and similar drawings. Include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - 6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 36" x 48 (See herein for electronic submittals)".
 - 7. Initial Submittal: Submit one black-line print for the Architect's review; the reproducible print will be returned, (see herein for electronic submittals).
 - a. Structural steel, metal deck and miscellaneous steel. Submit black line print and 3 copies for initial submittal.
 - 8. Final Submittal: Submit copies per enclosed requirements.
 - 9. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- C. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.
 - 1. Preparation of coordination Drawings include components previously shown in detail on Shop Drawings or Product Data.
 - 2. Submit coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.6 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."
 - 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.

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- b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
3. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.
4. Submittals: Submit copies of each required submittal; submit hardcopies where required for maintenance manuals. The Architect will retain one, and will return the other marked with action taken and corrections or modifications required.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.7 MATERIALS SPECIFIED

- A. The Contract is based on standards of quality established in the Contract Documents.
 1. In agreeing to the terms and conditions for the Contract, the Contractor has accepted the responsibility to verify that the specified products will be available and to place orders for all required materials in such a timely manner as needed to meet his agreed construction schedule.
 2. Neither the Owner nor the Architect has agreed to the substitution of materials or methods called for in the Contract Documents, except as they may specifically otherwise state in writing and when approved in advance of purchase and installation per requirements herein.
- B. Colors: Provide finish selections indicated in the Project Manual and Plans.
 1. Acceptable Manufacturers: The products and manufacturer's specified in the Project Manual and Plans are for purposes of establishing color selection options and quality.
 2. Manufacturer's Standard colors and Finishes: Where the Project Manual or Plans specifies a manufacturer's standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other non-listed manufacturer's "standard colors" from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated in the Project Manual of listed acceptable manufacturer in the Project Manual at no additional cost.
 3. Custom Colors: Where the Finish Schedule Project Manual and or Plan indicates a specific manufacturer's colors, other acceptable manufacturer shall provide matching custom colors where a standard color is not acceptable at no additional cost.

1.10 SAMPLES

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or

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fabricated components, small cuts or containers of materials, color range sets, complete units of repetitively used materials, units of work to be used for independent inspection and testing, and swatches showing color, texture and pattern.

1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's Sample. Include the following:
 - a. Generic description of the Sample.
 - b. Sample source.
 - c. Product name or name of manufacturer.
 - d. Compliance with recognized standards.
 - e. Availability and delivery time.
 2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 - a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 6), that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
 3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of full selection, submit three (3) full sets of choices for the material or product.
 - a. Color selection shall be done upon complete submittal of materials and/or products needing color selection. It is the responsibility of the general contractor to see to it that required submittals for color selection shall be submitted to the Architect prior to time for implementation to not affect project schedule.
 - b. Provide ninety (90) days time allowance for the Architect to work out preliminary schemes for College approval from receipt of complete color submittal of all items for this project.
 4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 4 sets; one will be returned marked with the action taken.
 5. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
1. Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.
 - a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

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1.8 MISCELLANEOUS SUBMITTALS

- A. Miscellaneous submittals are work related submittals (non-administrative) including warranties, maintenance agreements, workmanship bonds, survey data and reports, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar work related information and materials not process as shop drawings, product data or samples.
- B. Inspection and Test Reports: Classify and process each as either "shop drawing" or "product data", depending upon whether report is uniquely prepared for project or a standard publication.
- C. Warranties: Refer to "Products" section for specific general requirements on warranties, product/workmanship bonds, and maintenance agreements. In addition to copies desired for Contractor's use, furnish 2 executed copies, plus additional copies where required for maintenance manuals.
- D. Standards: Where submittal of a copy of standards is indicated, submit a single copy for Architect's/Engineer's use. Where workmanship at project site and elsewhere is governed by standard, furnish additional copies to fabricators, installers and others involved in performance of the work.
- E. Closeout Submittals: Refer to "Project Closeout" section for specific general requirements on submittal of closeout information, materials, tools, and similar items.
- F. Schedule of Values: Contractor shall submit Schedule of Values per Instructions to Bidders,. Refer to General Conditions for minimum list of items to be included in Schedule of Values. Changes in Schedule of Values will not be allowed after Notice to Proceed is issued, unless directed by Architect and/or Change Order items which shall carry their own value as a line item on Schedule of Values.
- G. Certified Payroll Records: Refer to "Prevailing wage rates and Apprenticeship Requirements" section for specific general requirements.
 - 1. All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement).
 - 2. General Contractor shall provide certification that all requirements for prevailing wage have been made with each application for payment, not limited to paying prevailing wage, documentation of prevailing wage and furnishing electronically to Labor Commissioner.

1.12 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return.
 - 1. Compliance with specified characteristics is the Contractor's responsibility.
 - 2. Numerous serious corrections, or incomplete submittals, will necessitate resubmittal, in which case, only one copy will be returned with notations. Contractor shall resubmit required number of sets with corrections made with original mark-up submittal for review.
- B. Conditions of Review: Architect's review is for general conformance with the design concept and contract documents. Review action on a submittal by the Architect does not in any way constitute a change order. Markings or comment shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures therefrom. The Contractor remains responsible for details and accuracy, for conforming an correlating all quantities and dimensions, for selecting fabrication processes for techniques of assembly, and for performing his work in a safe manner.
 - 1. The Contractor is responsible for coordination of his work with and between that of all

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- subcontractors and trades.
 - 2. Absolutely no deviation from the Contract Documents will be permitted without written acknowledgement from Architect of receipt and Review of Written Notification from the Contractor to the Architect accompanying this submittal of all deviations contained in this submittal.
 - 3. The Architect's review is not the final stage of acceptance for any part of the project, nor does it relieve the Contractor of its responsibilities.
 - 4. Contractor shall submit an itemized list of changes of items different than specified/indicated herein and on construction documents. List shall include items that are different and omitted. In the event items are not included on list, omitted from submittal and/or different than specified; Contractor shall be responsible for providing specified item(s). Liabilities subsequent to items omitted or different shall be the responsibility of Contractor and shall be warranted a minimum of five (5) years or greater as prescribed by law. If no list is included with Shop Drawings, Architect assumes all items are as specified. Items discovered within five (5) years of Notice of Completion shall be corrected and provided by Contractor and Subcontractor at no cost to Owner.
- C. Action: The Architect will identify each submittal with a uniform, self-explanatory action sheet. The sheet will be appropriately marked, as follows, to indicate the action taken:
- 1. No Exceptions Taken: If this box is marked, the work covered by the submittal may proceed provided it complies with the requirements of the contract documents; acceptance of the work will depend upon that compliance.
 - 2. Make Corrections Noted: If box is marked, the work covered by the submittal may proceed provided it complies with both the Architect's/Engineer's notations or corrections to the submittal and with the requirements of the contract documents; acceptance of the work will depend on that compliance. Submit corrected copy for record if requested by the Architect.
 - 3. Revise and Resubmit: If this box is marked, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal in accordance with the Architect's/Engineer's notations and resubmit without delay. Repeat if necessary.
 - 4. Rejected: If this box is marked, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal or prepare a new submittal in accordance with the Architect's/Engineer's notations and resubmit to Architect.
 - a. Do not permit submittals marked "Rejected" or, "Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.
 - 5. Action Not Required: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".
 - 6. Remarks: The review has occasioned comments that have been attached to the submittal. Process these comments as if they had been written on the submittal itself.
 - 7. Requires Intermediate Submittal: Submittal does not meet all requirements for a complete approval. Submittal requires additional information for processing.

1.13 SUBSTITUTIONS

- A. Substitution Request:
- 1. Cost to Contractor or Bidder for review of Substitution Request.
 - a. Each review of a Substitution Request by the Architect will be billed to the submitter (Contractor or Bidder) at the current hourly rate on file at Architect's office, two hour minimum for each review, whether approved or rejected.
 - b. The Contractor will have a thirty-five (35) day period from the contract award date, in which to review the total contract documentation and issue any substitution or clarification requests to the Architect free of any financial charge.

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- c. The Contractor will be expected to identify any omissions, anomalies, divergence or discrepancies in the Contract Documents within this time period and so inform the Architect, in writing.
 - d. Any such omissions, anomalies, divergence or discrepancies not identified to the Architect within this period shall be deemed to be included within the bid sum and not subject to a Change Order by the Architect.
 - 1) The Architect may waive the review cost if, in his sole opinion, the submittal was complete and the time involved in the review was not substantial, and it was in the best interest of the Owner.
2. Content of Request:
- a. Complete the attached Substitution Request Form (at the end of this Section), substantiating compliance of proposed substitution with Contract Documents.
 - b. For products, attach to the Substitution Request Form:
 - 1) Product identification, including manufacturer's name and address.
 - 2) Manufacturer's literature including product description, performance and complete test data and reference standards.
 - 3) Samples.
 - c. For construction methods, attach to the Substitution Request Form:
 - 1) Detailed description of proposed methods.
 - 2) Drawings illustrating methods.
 - d. Attach to the Substitution Request Form an itemized comparison of proposed substitution with product or method specified.
 - e. Provide long-term serviceability data comparing side by side analysis with specified materials.
 - f. Provide manufacturer's experience in years with product with specific product formulation that is to be substituted.
 - g. Provide certified warranty issued for this specific project including application--precisely.
 - h. Provide system component analysis and statement the product is certified by Contractor to be compatible with all other items of assemblies where product/material/method is specified.
3. In making request for substitution, Contractor attests that:
- a. Contractor has personally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.
 - b. Contractor will provide the same guarantee or warranty for substitution as for product or method specified.
 - c. Contractor will coordinate installation of accepted substitution into Work, making such changes as may be required for Work to be complete in all respects.
 - d. Contractor waives all claims for additional costs related to substitution which subsequently become apparent.
 - e. Contractor will pay all cost of Consultant to interpret physical properties to compare substitution with specified product, if requested by Architect.
 - f. Colors: The Contractor will match the color and/or finish available for the acceptable manufacturers listed in the Project Manual and/or Plans as a custom color and at no additional cost to the Owner.
4. Submit three (3) copies of Substitution Request prior to submittals required.

B. Acceptance of Substitutions

- 1. Procedures:

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- a. The Contract is based on materials, equipment and methods described in the Contract Documents.
 - b. Architect will consider proposals submitted in accordance with the Substitution Request.
 - c. Substitutions will be considered when submitted within 35 days after date of Contract.
 - d. Architect is solely responsible for judging the acceptance of substitutions.
 - e. Substitute materials, equipment or methods shall not be used unless such substitution has been specifically approved for this Work by the Architect and DSA.
 - f. Substitutions will not be considered if:
 - 1) They are indicated or implied on product submittals without formal request submitted in accordance with Substitution Request.
 - 2) Acceptance will require substantial revision of Contract Documents.
 - 3) They are submitted more than 35 days after date of Contract, unless the specified or drawing item has been verified to be discontinued or is otherwise unavailable, or the Owner desires a cost savings for the product or system.
 - g. Substitutions may be subject to DSA approval if Structural Safety, Fire/Life Safety or Accessibility is impacted.
2. Time to review: Architect shall be allowed twenty-eight (28) calendar days to review each substitution submittal. In the event review cannot be completed and more information is requested by the Architect to complete this review, upon receipt of requested information, twenty-eight (28) calendar days will be allowed for additional review after receipt of requested and complete information.

PART 2 - PRODUCTS

2.1 SUBSTITUTION REQUEST FORM

See the form attached to the end of this Section.

PART 3 - EXECUTION

3.1 GENERAL

The attached form will be reproduced by the Contractor or any of his Subcontractors for any and all proposed substitutions. No other forms will be accepted.



SUBSTITUTION REQUEST

DATE: _____	Substitution Request # _____
ATTN: Jose Vargas	PROJECT: Avenal E.S. Kindergarten
3434 Truxtun Avenue Ste 240	Avenal Elementary School
Bakersfield CA 93301	Reef Sunset Unified School District
PROJECT#: 394-0010	NOA DATE: _____

We hereby submit for your consideration the following product/ manufacturer instead of the one(s) specified in the Project Manual/ Plans:

Item: _____ Section #: _____

Manufacturer: _____ Sheet #: _____

A. Reason for not providing specified product: _____

B. Proposed Substitution: _____

C. Cost shall be shouldered by the undersigned for changes to the building design, including engineering and detailing costs caused by the requested substitution. (Negative response maybe cause for rejection.)

☐ Yes ☐ No Explain: _____

D. Provide the following with Substitution Request Package:

*NI –Not Indicated;
N/A – Not Applicable

Checklist for Architect

		Yes	No	N/A	NI
1	Attached data includes product data, specifications, photographs, samples, code approvals and laboratory test data adequate for evaluation of request. All test data shall be complete with relevant test(s).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Attach data includes description of change to contract documents that proposed substitution will have. Include complete information on changes to drawing and/ or project manual which proposed substitution will require for proper installation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Does proposed substitution affect dimensions shown on contract documents?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Does proposed substitution affect other trades and is it clear on the request form? Provide system component compatibilities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Does proposed substitution affect local availability of service and maintenance including where nearest service representative is located and travel time to project site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Attached cost data with detail breakdown of differential, either plus or minus.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	If substitution is of higher quality, will this impact future replacement cost?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	What is the impact of substitution on construction schedule?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Provide long term serviceability data compared with specified material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Provide manufacturing experience in years with product with specified material product formation substituted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Provide certified product warranty equal or greater to what is required for this project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Is a consultant required to integrate physical properties to compare material/product?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Will the Substitute Manufacturer provide colors matching color selection of listed manufacturers in Project Manual?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E. The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

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1. The undersigned will compensate the Architect, Architect's staff, and consulting engineers at Architect's rate per hour for changes required to the building design, including engineering design, detailing, and construction costs caused by the requested substitution. The Architect is herein defined as any of those firms or individuals listed by reference on the Directory, including all Consultants identified herein.
2. Attach all cost data with explanations if different from Specified or Drawing item. Include in that explanation a discussion on quality or proposed substitution and cost differential.
3. Attach all cost data with explanations if different from Specified or Drawing item. Include in that explanation a discussion on quality or proposed substitution and cost differential.
The undersigned will pay for any subsequent changes in incorporating the proposed substitution that were not apparent at the time of approval into the Work, including compensation to the Architect and consulting agent(s) as described in item 2 above.
4. The undersigned certifies that the substituted material/product/method is compatible with all the items in the system application's specified use in this project.
5. Failure to provide complete substitution package per above requirements are ground for rejection.

The undersigned states that the function, appearance and quality are equivalent or superior to the construction document item. The undersigned agrees to waive all claims for additional costs related to accepted substitution, including cost associated with changes to building design, engineering, or details, which may subsequently become apparent. (Negative response maybe cause for rejection.)

Submitted by: _____ Approved by General Contractor: _____
Signature

Signature: _____ Signed by: _____ Date: _____
Address: _____ Address: _____

Phone: _____ Fax: _____ Phone: _____ Fax: _____

ARCHITECT'S RESPONSE:

Date: _____

Reviewed by:

Remarks:

Substitution Request #:

- ☐ Accepted – Submit as construction submittal
- ☐ Accepted as noted – Submit as construction submittal
- ☐ Rejected – Use specified material
- ☐ Received too late – Use specified material

END OF SECTION 013300

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for quality control services.
- B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include periodic surveillance activities performed by the Architect.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
 - 1. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
 - 2. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 3. Refer to Structural Test and Inspection requirements.
 - a. Requirements at end of this Section for specific test required for this project.
- D. Soil Testing: Inspection of subgrade improvement operations, compacted fill and field density.
- E. Concrete Work: Testing and certification of concrete ingredients, compression cylinders, reinforcing steel and placement inspections.
- F. Related work specified elsewhere:
 - 1. Division 31 Section "Earthwork" for requirements and related earthwork testing.
 - 2. Division 3 Section "Cast-in-Place Concrete" for requirements and related concrete testing & inspection.

1.3 COOPERATION

- A. Laboratory shall cooperate with all trades whose work affects or is affected by the tests and inspections.
- B. Cooperation: Contractor to cooperate with and provide testing laboratory opportunity and assistance in taking samples, making field tests and making inspections.

1.4 SPECIAL PROVISIONS

- A. Governing Agency: Shall be as specified in Section 014300.
- B. Laboratory: To be approved by Owner, Architect, Structural Engineer and DSA. Laboratory shall be in the employ of the Owner.
- C. Duties of Testing Laboratory: Inspect stock, mark identified stock, select and mark test specimens,

perform required tests, inspections as specified, furnish required reports and certificates.

- D. Reports: To be executed immediately upon conclusion of each procedure and forwarded to:
Architect - Structural Engineer - Contractor - Owner - Subcontractor - Job Inspector - Governing Agency
1. The Division of the State Architect is the Governing Agency for this project, one copy of all test reports shall be forwarded to that Office by the testing agency. Such reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of Title 24 and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or not the material or materials tested comply with requirements.
 2. Verification of Test Reports: Each testing agency shall submit to the Division of the State Architect a verified report in duplicate covering all of the tests which are required to be made by that agency during the progress of the project. Such report shall be furnished each time that work on the project is suspended, covering the tests up to that time, and at the completion of the project, covering all tests.
- E. Payment: The Owner shall pay for all tests, except costs of concrete mix design. When, in the opinion of the Architect or the Division of the State Architect, additional tests are required, then such tests and inspection shall be paid for by the Owner but the amount paid shall be deducted from the Contract Price. Examples of such additional tests are: Tests of material substituted for previously accepted materials, unidentified materials, retests made necessary by the failure of materials to comply with the requirements of the specifications and load tests necessary because certain portions of the structure have not fully met specification or plan requirements.
1. Travel to Shop Fabrication Facility: Where fabrication facility is more than 200 driving miles one way, using AAA maps, from project site, Contractor shall pay for all excess mileage charges over 200 miles one way, subsistence, lodging and drive time of Owner's inspection and testing team to do testing and inspection at fabrication facility.
 2. All testing and inspection work provided by Laboratory shall be done during normal working hours, (none premium). In the event over time and or premium time is required by the Laboratory, field and or laboratory time, due to contractor request and or contractor scheduling, all costs over normal time shall be paid by contractor. Laboratory shall identify costs as a separate invoice and all costs tracked for reimbursement to Owner by Contractor. Laboratory shall identify who approved premium costs and reason for each line item on invoice.
- F. Selection of Samples: All samples and specimens for testing shall be selected by the inspector or by the testing laboratory, but not by the Contractor. The Contractor shall, at his own expense, furnish, package, mark and deliver all samples to be tested, when so directed by the inspector, testing laboratory, or as required by the Specifications. Delivery of samples to the testing laboratory shall be made in ample time to allow tests to be made without delaying construction. No extra time will be allowed for the completion of the work by reason of delay in testing samples. The Contractor shall allow free access at all times to the representatives of the testing laboratory to the sources from which samples are taken.
- G. Preparation of Specimens: Taken by and at expense of fabricator under direction of testing laboratory and machined or prepared to conform to appropriate ASTM specification. Cost of machining specimens is considered part of the testing.
- H. Architect and Structural Engineer reserve(s) the right to demand for test and special examination any materials or part thereof to insure compliance with Specifications, and may reject for satisfactory replacement, any material or part judged defective as a result thereof. Applies also to materials or sources of the same substituted for those previously approved. Such tests or examinations, even though not specified, shall be performed as and when required. Costs paid for by Owner, but the amount paid shall be deducted from the Contract.
- I. Owner's Right to Waive Tests and Inspections: The Owner reserves the right to waive any part or all of

the tests and inspections, subject to the approval of the Architect, Structural Engineer and DSA in writing.

1.5 OWNER'S INSPECTOR OF RECORD (PROJECT INSPECTOR)

- A. An inspector employed by the Owner and approved by DSA in accordance with the requirements of the State of California Code of Regulation, Title 24, Part 1, Administrative Code, will be assigned to the work. His duties are specifically defined in Sec 4-342.
- B. The work of construction in all stages of progress shall be subject to the personal continuous observation of the inspector. He shall have free access to any or all parts of the work at any time. The Contractor shall furnish the inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.
 - 1. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
 - a. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
 - b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
 - c. Providing facilities for storage and curing of test samples.
 - d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 - e. Security and protection of samples and test equipment at the Project site.
 - 2. One or more Inspectors, including specialty Inspectors as required, employed by Owner in accordance with the requirements of the California Code of Regulations will be assigned to the work. All work shall be performed under the observation of or with the knowledge of the Project Inspector. The Project Inspector shall have free access to all parts of the Work at any time. Contractor shall furnish the Project Inspector with such information as may be necessary to keep the Project Inspector fully informed regarding the progress and manner of work and the character of materials.
 - 3. Observations by the Project Inspector shall not in any way relieve Contractor from responsibility for full compliance with all terms and conditions of the Contract Documents, or be construed to lessen to any degree Contractor's responsibility for providing efficient and capable superintendence.

1.6 DUTIES OF THE TESTING AGENCY

- A. The independent testing agency approved by DSA engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
 - 1. The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
 - 3. The agency shall not perform any duties of the Contractor.
- B. Coordination: The Contractor and each agency engaged to perform inspections; tests and similar

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services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities during normal working hours, none premium time for Laboratory of Record including field, office and off site laboratory time.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching."
- B. Protect construction exposed by or for quality control service activities, and protect repaired construction.
- C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

3.2 EARTHWORK (Refer to Section 312000) For test and inspection see Chapter 1, 17A and 18A 2013 CBC and herein. Test and Inspection requirements per DSA at end of Part 3.

- A. Testing Agency: Any required foundation consultation, examination or testing shall be done by an approved Geotechnical Engineer. Costs paid by Owner.
- B. Consultation or Procedures for this part of the work shall consist of the following:
 1. Examination of exposed subgrades resulting from the cutting operation, including field density tests, if considered necessary.
 2. Verify completed foundation excavation.
 3. Periodic inspection of any required filling and backfilling, including field density tests, if considered necessary.
 4. Imported or Native Fill Material: Approve material; perform suitability tests for compaction, qualities and optimum moisture if required.
 5. Provide Continuous Inspection Supervision during removal and recompaction of existing soil and placement of fill.
 6. Inspect and approve completed footing excavations.
 7. Field Density Tests shall be made on samples from material in place as required to verify proper compaction densities of fills and backfills.
- C. Densities and Method: Densities specified relate to ASTM Designation D-1557-00-e1, Method A.

3.3 CONCRETE WORK (REFER TO SECTION 033000)

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A. Inspections:

1. Notification: The Contractor shall notify the following people, giving advance notice prior to commencing the designated work:

<u>Person Notified</u>	<u>Advance Notice</u>	<u>Prior to Commencing</u>	<u>For Inspection</u>
Architect/Project Inspector	24 hours	Form Work	Excavation
Architect/Project Inspector	48 hours	Pouring Conc.	Forms & Steel
Structural Engineer	7 days	Casting Concrete	Forms & Steel

2. No concrete shall be poured except in the presence of the Owner's Inspector and only after the forms and reinforcing steel have been approved by the Project Inspector. A record shall be kept on the site of the time and date of placing the concrete in each portion of the structure. Such record shall be kept until the completion of the structure and shall be open to the inspection of the enforcement agency.
3. Batch Plant Inspections: Batch plant inspections shall be per CBC Sec. 1704A.4.2 & 1704A.4.3. When transit mixed concrete is used, continuous inspection shall be maintained at the plant by a qualified concrete technician who shall issue tickets certifying that quantities and quality of all materials used in the concrete are in accordance with these specifications and the approved design mix. The Owner will pay the costs of this inspection. This inspection will not be required for non-structural concrete (as defined in Paragraph (4) following).
4. Bonded Weighmaster Certificates: Non-structural concrete such as walks, curb and gutter, etc., shall not require continuous batch plant inspection, but instead, a bonded weighmaster shall furnish notarized affidavits certifying that quantities and quality of all materials used in the concrete are in accordance with these Specifications and the approved mix design. Comply with CBC 1916A and 1704A.4.3.
 - a. Copies of Bonded Weighmaster Certificates shall be submitted to the Architect along with pay requests for work done. Payment will not be made on non-structural concrete items poured requiring Bonded Weighmaster Certificates without receipt of Certificates of items poured requesting payment.

B. Tests: All concrete materials to be tested and reported prior to any use of same.

1. Portland cement shall be tested in accordance with CBC, 1916A.1, 1704A.4.1 and ASTM C-150. The concrete supplier shall submit to the Architect, Structural Engineer, Project Inspector, Project Testing Laboratory and Division of State Architect certification of compliance based on required testing.
2. Aggregate: Shall be in conformance with CBC Sec. 1704A.4.1, 1903A.5, ACI 318, Section 3.3.2 and, where the source is determined to be questionable by the Structural Engineer or by DSA, shall be tested in accordance with ASTM C289. Test samples shall be obtained from the source for both coarse and fine aggregate; a minimum of one sample shall be retrieved and tested for each 200 Tons of aggregate to be used in the project concrete. A qualified Laboratory that is certified by the Cement and Concrete Reference Laboratory shall perform the testing.
3. Reinforcing Steel: To be tested prior to use for compliance with CBC Sections 1916A.2, 1704A.4.1 and ASTM A-615/706 requirements.
 - a. Samples: To be selected by representative of testing laboratory from material at the building site or place of distribution, to consist of two (2) pieces, each eighteen inches (18") long of each size, furnished, cut and prepared for testing by Contractor, marked and delivered by representative of testing laboratory.
 - b. Tests: One (1) tension and one (1) bend test shall be made of each size of reinforcing steel including wire fabric. One (1) series of tests shall be made for each ten (10) tons or

fraction thereof of each size of reinforcing steel if the bundles, as delivered, can be identified as to heat number and the mill analysis, accompany the report. If they cannot be identified as to heat number, then one (1) series of tests shall be made from each two and one-half (2½) tons or fraction thereof.

4. Cylinder Tests shall comply with CBC Sec. 1905A.1 and 1905A.6.

- a. Four (4) cylinders of concrete shall be made for each fifty (50) cubic yards of each grade concrete, or not less than once for each 2000 sq.ft. of slab or fraction thereof, being placed each day. Each cylinder shall be dated, given a number, the point in the structure from which the sample was taken noted thereon, and the slump noted thereon. Comply with CBC 1905A.
- b. Test cylinders shall be made at the job and stored in the testing laboratory in accordance with ASTM C-31. At the end of twenty-four (24) hours after making, the cylinders shall be stored under moist curing conditions at approximately 70 degrees F. and maintained therein until tested. The cylinders shall be tested in accordance with CBC 1905A.6 and ASTM C-39. The cylinders shall develop the following minimum ultimate compressive strengths:

<u>Design Strength</u>	<u>7-Day Test</u>	<u>28-Day Test</u>
4000 p.s.i.	2400 p.s.i.	4000 p.s.i.

- c. If the strengths of the first two cylinder tests are satisfactory, the third cylinder shall not be tested, but destroyed. The third cylinder shall be tested if the strengths of the first two cylinders are not satisfactory.
- d. If the strength of the cylinders does not meet the minimum as mentioned above, core tests of the hardened concrete shall be made in accordance with CBC 1905A.6 and ASTM C-42. If the core tests show the concrete strength to be deficient, the concrete shall be deemed defective and removed. The Contractor shall reimburse all costs of these core tests with a negative Change Order.

- C. Laboratory-Designed Mixes: See Paragraph 2.5, Proportioning and Design of Mixes, Section 033000 and CBC 1905A.2, 1905A.3 and 1905A.4.

3.4 TEST AND INSPECTION REQUIREMENTS PER DSA (WHERE APPLICABLE COORDINATE WITH DSA-3)

TITLE 24,PART 2 (2016 CBC) VOLUME 1
TESTS AND INSPECTION REQUIREMENTS

EXTERIOR WALL COVERINGS
CHAPTER 14A

MATERIALS:

- | | |
|-------------------|-----------------------|
| 1. MASONRY UNITS | 2102A.2 |
| 2. INSPECTION | 2105A |
| 3. MORTAR & GROUT | 2102A.2, 2103 A.3,A.4 |

ROOFING & ROOF STRUCTURES
CHAPTER 15

SITE WORK.DEMOLITION & CONSTRUCTION
CHAPTER 33

INSPECTION:

1. EXCAVATION AND FILLS

1704A.7

TITLE 24,PART 2 (2016 CBC) VOLUME 2
TESTS AND INSPECTION REQUIREMENTS

FOUNDATIONS

CHAPTER 17A & 18A

CONCRETE

CHAPTER 17A & 18A

MATERIALS:

1. PORTLAND CEMENT
2. CONCRETE AGGREGATES
3. REINFORCING BARS

1704A.4.1, 1916A.1
1704A.4.1, 1903A.1
1704A.4.1, 1916A.2

QUALITY:

1. PROPORTIONS OF CONCRETE
2. STRENGTH TESTS OF CONCRETE
3. SPLITTING TENSILE TESTS

1905A.2, 1905A.3, 1905A.4
1905A.6,1905A.1.1
1905A

INSPECTION:

1. JOB SITE
2. BATCH PLANT
3. WAIVER OF BATCH PLANT INSPECTION
4. REINFORCING BAR WELDING

1905A.7
1704A.4.2
1704A.4.3
1903A.7, 1704A.3.1.3 &
1704A.3.1.4

MASONRY

CHAPTER 21A

MATERIALS:

1. MASONRY UNITS
2. PORTLAND CEMENT, LIME
3. MORTAR AND GROUT AGGREGATES
4. REINFORCING BARS

2103A.1
2103A
2103A.8, 2103A.12, 2103A.12.3
2103A.13.1

QUALITY:

1. PORTLAND CEMENT TESTS
2. MORTAR AND GROUT TESTS
3. MASONRY PRISM TESTS
4. MASONRY CORE TESTS
5. MASONRY UNIT TESTS
6. REINFORCING BAR TESTS

1916A.1
2105A.5
2105A.2.2.2
2105A.4
2105A.2.2.1
1916A.2

INSPECTION:

1. REINFORCED MASONRY
2. REINFORCING BAR WELDING

1704A.5
1704A.4.2

STEEL

CHAPTER 22A

MATERIALS:

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- | | |
|--|--------------------------|
| 1. STRUCTURAL STEEL, COLD FORMED STEEL | 2205A.1,2209A.1, 2210A.1 |
| 2. IDENTIFICATION | 2203A.1 |

QUALITY:

- | | |
|--|-----------|
| 1. TESTS OF STRUCTURAL AND COLD FORMED STEEL | 2212A.1 |
| 2. TESTS OF HIGH STRENGTH BOLTS, NUTS, WASHERS | 2212A.2 |
| 3. TESTS OF END WELDED STUDS | 2212A.3 |
| 4. TESTS FOR BEAM-TO-COLUMN MOMENT CONNECTION | 2212A.4 |
| 5. NON DESTRUCTIVE WELDS TESTS | 1704A.3.1 |

INSPECTION:

- | | |
|---|---------------|
| 1. SHOP FABRICATION | 1704A.3.2 |
| 2. WELDING | 1704A.3.1 |
| 3. NELSON STUD WELDING | 1704A.3.1.1 |
| 4. HIGH STRENGTH BOLT INSTALLATION | 1704A.3.3 |
| 5. EXAMINE SEAM WELDS OF STRUCTURAL TUBES & PIPES | DSA I.R 17-3 |
| 6. DECK WELDING | DSA I.R. 17-3 |

END OF SECTION 014000

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2019 CBC

Application Number: 02-118640	School Name: Avenal Elementary	School District: Reef Sunset Unified School District
DSA File Number: 16-33	Increment Number:	Date Created: 2020-11-04 21:55:57

2019 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2019 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

Application Number: 02-118640	School Name: Avenal Elementary	School District: Reef Sunset Unified School District
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Geotechnical Reports: Project has a geotechnical report, or CDs indicate soils special inspection is required by GE

	1. GENERAL:	Table 1705A.6		
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings are adequate to achieve the design bearing capacity.	Periodic	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)

	2. SOIL COMPACTION AND FILL:	Table 1705A.6		
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (Refer to specific items identified in the Appendix for exemptions where soils SI and testing may be conducted under the supervision of a geotechnical engineer or LOR's engineering manager. In such cases, the LOR's form DSA 291 shall satisfy the soil SI and test reporting requirements for the exempt items.)

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

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<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of the geotechnical engineer. (Refer to specific items identified in the Appendix for exemptions where soils testing may be conducted under the supervision of a geotechnical engineer or LOR's engineering manager. In such cases, the LOR's form DSA 291 shall satisfy the soil test reporting requirements for the exempt items.)
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3. DRIVEN DEEP FOUNDATIONS (PILES):		Table 1705A.7		
Test or Special Inspection		Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

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<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.
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	4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):	Table 1705A.8		
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
<input checked="" type="checkbox"/>	b. Verify pier locations, diameters, plumbness, bell diameters (if applicable), lengths and embedment into bedrock (if applicable); record concrete or grout volumes.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
<input type="checkbox"/>	c. Confirm adequate end strata bearing capacity.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
<input checked="" type="checkbox"/>	d. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

	5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See Section 2 above).

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

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<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 16-3.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

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7. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
Material Verification and Testing:				
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Periodic	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-14 Section 26.6.1.2; DSA IR 17-10. (See Appendix for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-14 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'_c).	Test	LOR	1905A.1.15; ACI 318-14 Section 26.12.
Inspection:				
<input checked="" type="checkbox"/>	e. Batch plant inspection: Continuous	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or eliminated per 1705A.3.3.2. (See Appendix for exemptions.)
<input checked="" type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		

8. PRESTRESSED / POST-TENSIONED CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):
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DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number: 02-118640	School Name: Avenal Elementary	School District: Reef Sunset Unified School District
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	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 11. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-14 Section 26.13

	9. PRECAST CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-14 Section 26.13.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.

	10. SHOTCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	Type	Performed By	Code References and Notes

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

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<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.19, Table 1705A.3 Item 7, 1908A.6, 1908A.7, 1908A.8, 1908A.9, 1908A.11, 1908A.12. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.5, 1908A.10.

	11. POST-INSTALLED ANCHORS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix for exemptions). ACI 318-14 Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input checked="" type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix for exemptions.)

	12. OTHER CONCRETE:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Masonry), 2019 CBC

1705A.4; TMS 602-16, Tables 3 and 4.

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13. STRUCTURAL MASONRY:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
Material Verification and Testing: (See Appendix for exemptions.)				
<input type="checkbox"/>	a. Mill certificate indicates compliance with requirements for reinforcement, anchors, ties, fasteners and metal accessories. See item 7b for identification, sampling and testing of reinforcing steel.	Periodic	SI*	2103A.4; TMS 602-13 Article 1.5B.2 & 2.4. * To be performed by qualified LOR representative. Applicable testing by LOR. See IR 17-10.16 for unidentified reinforcing steel.
<input type="checkbox"/>	b. Producer's certificate of compliance for masonry units, mortar and grout materials.	Test	LOR	1705A.4, 2103A.2.1, 2103A.3, 2103A.5; TMS 602-16 Articles 2.1, 2.2, 2.6A and 2.6B, and Table 6 footnote 3.
<input type="checkbox"/>	c. Test masonry (f'_m).	Test	LOR	1705A.4. For Unit Strength: 2105A.3 (2114.6.1+); TMS 602-16 Articles 1.4B.2, 1.5B.1 & 1.5B.2. For Prism (required when $f'_m > 2000$ psi): 2105A.2; TMS 602-16 Articles 1.4B.3, 1.4B.4, 1.5B.1 & 1.5B.2.
<input type="checkbox"/>	d. Verify proportions of site prepared, premixed or preblended mortar and grout.	Periodic	SI	TMS 602-16 Table 3 Item 5, Table 4 Item 1a & 2d.
<input type="checkbox"/>	e. Test core-drilled samples.	Test	LOR	2105A.4. (See Appendix for exemptions.)
Inspection: (See Appendix for exemptions.)				
<input type="checkbox"/>	f. Inspect preparation of prisms.	Continuous	SI	TMS 602-16 Articles 1.4.B.3 & 1.4.B.4 & Table 4 Item 4.
<input type="checkbox"/>	g. Verify size, location and condition of all dowels, construction supporting masonry, etc.	Periodic	SI	

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1705A.4; TMS 602-16, Tables 3 and 4.

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<input type="checkbox"/>	h. Verify size, grade and type of reinforcement and anchor bolts.	Periodic	SI	TMS 602-16 Table 4 Item 1c.
<input type="checkbox"/>	i. Welding of reinforcing steel.	TMS 602-16 Table 4 Item 3e. Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		
<input type="checkbox"/>	j. Inspect placement of reinforcement and connectors.	Continuous	SI	TMS 602-16 Table 4 Item 2c.
<input type="checkbox"/>	k. Inspect placement of masonry units and construction of mortar joints.	Periodic	SI	TMS 602-16 Table 4 Item 3b.
<input type="checkbox"/>	l. Verify preparation, construction and protection of masonry during cold weather (temperature below 40° F) or hot weather (temperature above 90° F).	Periodic	SI*	TMS 602-16 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	m. Inspect type, size and location of anchors and all other items to embedded in masonry including other details of anchorage of masonry to structural members, frames and other construction.	Continuous	SI	TMS 602-16 Table 4 Item 3d.
<input type="checkbox"/>	n. Inspect grout space prior to placement of grout.	Continuous	SI	TMS 602-16 Table 4 Item 2a.

14. VENEER OR GLASS BLOCK PARTITIONS: 1705A.4.1; TMS 602-16 Tables 3 and 4.				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify proportions of siteprepared mortar and grout and/or verify certification of premixed mortar.	Periodic	SI	TMS 602-16 Table 3 Item 5 and Table 4 Items 1a & 2d.

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1705A.4; TMS 602-16, Tables 3 and 4.

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<input checked="" type="checkbox"/>	b. Inspect placement of units and construction of mortar joints.	Periodic	SI	TMS 602-16 Table 4 Item 3b.
<input checked="" type="checkbox"/>	c. Inspect placement of reinforcement, connectors and anchors.	Periodic	SI	TMS 602-16 Table 4 Item 2c.
<input checked="" type="checkbox"/>	d. Inspect type, size and location of anchors and all other items to be embedded in masonry including details of anchorage of masonry to structural members, frames and other construction.	Periodic	SI	TMS 602-16 Table 4 Item 3d.
<input checked="" type="checkbox"/>	e. Verify preparation, construction and protection of masonry during cold weather (temperature below 40° F) or hot weather (above 90° F).	Periodic	SI*	TMS 602-16 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA.
<input checked="" type="checkbox"/>	f. Test veneer bond strength	Test	LOR	1410.2.1; TMS 402 Article 12.3.2.4. (Field constructed mock-up laboratory tested in accordance with ASTM C482).

15. POST-INSTALLED ANCHORS IN MASONRY:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of postinstalled anchors	See Notes	SI*	1617A.1.19, 1705A.4, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic); ACI 318-14 Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA. (See Appendix for exemptions.)
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1705A.4, 1910A.5. (See Appendix for exemptions.)

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1705A.4; TMS 602-16, Tables 3 and 4.

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	16. OTHER MASONRY:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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17. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
Material Verification and Testing:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-16 Section A3.1 & A3.2, AISI S240-15 Section A3 & A5, AISI S220-15 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
Inspection:				
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).

18. HIGH-STRENGTH BOLTS: RCSC 2014				
Material Verification and Testing of High-Strength Bolts, Nuts and Washers:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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<input type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
Inspection of High-Strength Bolt Installation:				
<input type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. * "Continuous" or "Periodic" depends on the tightening method used.

	19. WELDING:	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3 (See Appendix for exemptions.)		
Verification of Materials, Equipment, Welders, etc.:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
☑	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	DSA IR 17-3.
☑	b. Verify weld filler material manufacturer’s certificate of compliance.	Periodic	SI	DSA IR 17-3.
☑	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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19.1 SHOP WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

19.2 FIELD WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-15 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

20. NONDESTRUCTIVE TESTING: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; ANSI/ASNT CP-189, SNT-TC-1A; AWS D1.1, AWS D1.8; DSA IR 17-2.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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<input checked="" type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; ANSI/ASNT CP-189, SNT-TC-1A; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

21. STEEL JOISTS AND TRUSSES: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

22. SPRAY APPLIED FIRE-PROOFING: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.14.
<input type="checkbox"/>	b. Test bond strength.	Test	LOR	1705A.14.6.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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<input type="checkbox"/>	c. Test density.	Test	LOR	1705A.14.5.
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	23. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Sample and test anchor bolts and anchor rods not readily identifiable per procedures noted in DSA IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Sample and test threaded rods not readily identifiable per procedures noted in DSA IR 17-11.

	Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

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26. OTHER:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Load test for identified product(s):	Test	LOR	1709A.2, 1709A.3. Testing is not required for: 1) a product with a valid evaluation service report per DSA IR A-5, or 2) a product that can be justified by structural calculation.
<input type="checkbox"/>	b. Installation torque for non-HS bolts	Continuous	SI*	Applicable to communication towers identified as Essential Service Facility Projects (ESFP). Calibrated wrench use required, verified by SI during installation. DSA Policy PL 18-01: Communication Towers, Poles and Buildings Utilized by State Agencies for Essential Services Communications.*EXCEPTION: Non-ESFP may use PI without need for notification to DSA.
<input checked="" type="checkbox"/>	c. Fabric	Periodic	PI	Verify fabric certification documentation

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

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Exempt items given in DSA IR A-22 or the 2019 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing designed based on minimum allowable pressures per CBC Table 1806A.2 and having no geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill.

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding") given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding."
<input checked="" type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.

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<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1.16. Refer to construction documents for specific exemptions accordingly for each applicable wall condition.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	Welding:
<input type="checkbox"/>	1. Solid-clad and open-mesh gates with maximum leaf span or rolling section for rolling gates of 10' and apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections 19, 19.1 and/or 19.2 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections 19, 19.1 and/or 19.2 of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

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<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for section 19, 19.1 and/or 19.2 located in the Steel/Aluminum category).
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) $\leq 4'$ above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

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Name of Architect or Engineer in general responsible charge:

James Patrick Fogarty

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

11/04/20

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-118640 INC:
REVIEWED FOR
SS ☒ FLS ☒ ACS ☒
DATE: 11/13/2020

DSA 103-19: LIST OF REQUIRED VERIFIED REPORTS, CBC 2019

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1. Soils Testing and Inspection: Geotechnical Verified Report Form DSA 293

2. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

3. Concrete Batch Plant Inspection: Laboratory Verified Report Form DSA 291

4. Post-installed Anchors: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

5. Masonry Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

6. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

7. Field Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but is not limited to, the following:
 - 1. DSA Reports.

1.3 GOVERNING (REVIEWING AND APPROVING) AGENCY

- A. The Governing (Reviewing and Approving) Agency for this project shall be:

REEF-SUNSET UNIFIED SCHOOL DISTRICT
AND DIVISION OF THE STATE ARCHITECT
STRUCTURAL SAFETY SECTION (DSA/SSS)
ACCESS COMPLIANCE (DSA/ACS)
FIRE LIFE SAFETY (DSA/FLS)

1.4 STATE LAWS AND REGULATIONS

- A. The project shall be constructed under the complete jurisdiction of all laws of the State of California governing the construction of public buildings, to wit:
 - 1. 2013 Title 24, Parts 1, 2, 3, 4, 5 & 9 of the California Code of Regulations.
 - 2. All laws governing the employment of labor, qualifications for employment, posting of minimum wage rates, hours of work, employment of aliens, payment for employees, convict-made materials, domestic and foreign materials and accident prevention.
 - 2. Public Health Code of California State Department, of Public Health.
 - 3. Title 19 of the California Code of Regulations entitled "Public Safety", Chapter 1, State Fire Marshal, Subchapter 1, "General Fire and Panic Safety".
 - 5. General Industrial Safety Orders: Each and every Contractor shall observe and conform to the provisions of Title 8, California Administrative Code bearing upon safe and proper use, construction, disposal, etc., of materials, machinery and building appurtenances as therein set forth.
 - 6. Code Rules and Safety Orders: All work and materials shall be in full accordance with the latest rules and regulations of the State Fire Marshal; the safety orders of the Division of Industrial Safety, Department of Industrial Relations, and any State Laws or Ordinances. Nothing in these plans and specifications is to be construed to permit work not conforming to these codes.
 - 7. National Board of Fire Underwriters.
 - 8. Occupational Health and Safety Act. (OSHA)

All of the above laws and regulations, through referral herein, are as much a part of

the Contract as if they were incorporated in their entirety in this Section.

1.5 LAWS TO BE OBSERVED

- A. The Contractor shall keep himself fully informed of all existing and future State and Federal laws and county and municipal ordinances and regulations which in any manner affect those engaged or employed in the Work, or the materials used in the Work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the Work. He shall at all times observe and comply with, and shall cause all his agents and employees to observe and comply with all existing and future laws, ordinances, regulations, orders and decrees of bodies or tribunals having any jurisdiction or authority over the Work.

Should the Contractor claim that additional cost is involved because of any change in the law, regulation, code or ordinance, he shall make a claim as provided herein.

1. Contractor shall be licensed and regulated by the Contractors' State License Board pursuant to Business and Professions Code S7000 et seq.
2. Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the Contract shall forthwith be physically amended to make such insertion or correction.
3. Contractor shall not be compensated for additional costs incurred due to changes in laws, regulation, code or ordinances made before date of project bid date, only those after bid date and approved by the Architect.

1.6 TESTS AND INSPECTIONS

- A. Tests and Inspections shall be in accordance with Title 24 Part 1 & 2 and as specified herein.
- B. The Architect or Structural Engineer in general responsible charge shall designate the testing of materials consistent with the needs of the project and shall issue specific instructions to the testing agency.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 014300

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B. Temporary utilities required include but are not limited to:
 - 1. Water service and distribution
 - 2. Temporary electric power and light
- C. Temporary construction and support facilities required include but are not limited to:
 - 1. Temporary heat
 - 2. Field offices and storage sheds
 - 3. Sanitary facilities, including drinking water
 - 4. Temporary enclosures
 - 5. Temporary Project identification signs and bulletin boards
 - 6. Waste disposal services
 - 7. Construction aids and miscellaneous services and facilities
 - 8. Temporary access to occupied buildings
 - 9. Temporary signs indicating building access during construction
 - 10. Storm water prevention measures
 - 11. Temporary construction fence around buildings as required to secure and buildings and related work.
 - 12. Temporary access ramps to building
 - 13. Temporary access to buildings
 - 14. Dust control measures
- D. Security, protection and miscellaneous facilities required include but are not limited to:
 - 1. Temporary fire protection
 - 2. Barricades, warning signs, lights
 - 3. Enclosure fence at buildings
 - 4. Environmental protection
 - 5. Enclosure fence at site work around each portion of site work
- E. Special Requirements:
 - 1. Refer to Section 011000 for the following items that relate to the project:
 - a. Construction Activity Management Plans (SJVAPCD)

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- b. Dust Control Plan (SJVAPCD)
- c. Storm Water Management Plan (State Water Resource Board)
- d. Indirect Source Review Plan (SJVAPCD)

1.3 SUBMITTALS

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.
- B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.
- C. Temporary Facility Site Plan: Submit a scaled Site Plan indicating all locations of temporary offices, storage units, fences - both long and short-term - by phase.

1.4 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
 - 1. California Building Code requirements – Chapter 33.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, Fire Department and Rescue Squad rules.
 - 5. Environmental protection regulations.
 - 6. California State Accessibility standards, Title 24.
 - 7. California Fire Code Chapters 5 & 14.
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
 - 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
 - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with California Electric Code (CEC).
- C. The Contractor shall maintain, at the site, one (1) copy of the California Building Code, Title 19 and Title 24 (parts 1-5 & 9) of the California Code of Regulations.

1.5 PROJECT CONDITIONS

- A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not

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overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

- C. Site Access: Shall be coordinated with the Director of Maintenance and Operations. All areas damaged by construction work shall be remedied to his satisfaction. Access by persons with disabilities shall be maintained during construction. Architect shall approve all temporary persons with disabilities access to project area prior to implementing any work.
- D. Advertising Matter: No advertising matter of any kind will be allowed on any part of the work in the field unless approved by the Architect and the Owner. Contractor shall provide 36" x 48" bulletin board for required posted materials viewable by all workers.
- E. Drawings and Specifications at the Site: The Contractor shall maintain at the site for the Owner one copy of all Drawings, Specifications, Addenda, Approved Shop Drawings, Change Orders and other modifications, in good order and marked to record all changes made during construction. These shall be available to the Architect. The Drawings, corrected to record all changes during construction, shall be delivered to him for the Owner upon completion of the Work. See also Project Closeout, Section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B. Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."
 - 1. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
 - 2. For fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.
 - 3. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8" thick exterior plywood.
- C. Paint: Comply with requirements of Division-9 Section "Painting."
 - 1. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.
- D. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
- E. Water: Provide potable water approved by local health authorities.
- F. Open-Mesh Metal Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized wire top strand and galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts.
- G. Open-Mesh Plastic Fencing: Plastic 2-inch fabric fencing, 6 feet high with galvanized steel pipe

post, 1-1/2" O.D. for line and corner post.

2.2 EQUIPMENT

- A. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.
- G. Temporary Offices: The General Contractor shall provide and maintain during progress of the work a field office building for the Inspector. Each office shall be equipped with one window and one door. The Inspector's office shall have a separate entrance to exterior. Inspector's office shall be separated from Contractor's office by full-height partition wall – STC 45.
 1. Each office shall be provided with six (6) electric outlets, data outlets, complete with wiring, fluorescent lights 3 watts/sf, and HVAC all of which shall be connected to service. Project Inspector and Architect shall have use of water, computer/internet, telephone, copier, and fax at no charge for items related to this project. Contractor shall provide a minimum 10'x10' field office for this project for inspector and 10' x 20' minimum field office for Contractor staff and project meetings.
 2. Furnish and equip offices as follows:

	General Contractor	Inspector
Telephone	2 (1 w/hands-free function)	1
Plan Table 96 x 36	2	1
4 Drawer Files	1	1
6 Shelf Bookcase	1	1
Desk	2	1
Meeting Table 96 x 36	1	
Chairs	8	3
Bottle Water/Cooler	1	
Copier – Plain Paper	1	
Fax Machine	1	

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Telephone Answering Machine	1	1
Computer with internet access	1	
Printer	1	
Telephone lines	2	2

- H. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. Provide a ratio of one (1) toilet per ten (10) workers on job site, but not less than two (2) toilets.
- I. First Aid Supplies: Comply with governing regulations.
- J. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of CCR recommended classes for the exposures.
 - 1. Comply with Title 19 CCR Division 1, Chapter 3 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
 - 1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 - 3. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect, and will not be accepted as a basis of claims for a Change Order.
 - 4. The Contractor shall provide and pay for telephone services in the offices. The Architect, or his representative and inspector shall have unrestricted use of the phone for business purposes connected with this project.
- B. Water Service: Install water service and distribution piping of sizes and pressures adequate for

construction until permanent water service is in use.

1. Sterilization: Sterilize temporary water piping prior to use.
 2. Provide temporary water meter where Owner's water will be used.
 3. Fire access per CFC 1410.1.
 4. Fire water service to be active prior to arrival of combustible materials on site per CFC Sections 501.4 and 1412.1.
- C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.
1. Except where overhead service must be used, install electric power service underground.
 2. Where existing electrical power is available, owner will pay for usage of electrical power on site for contractor's use during period of construction. Contractor is responsible for all connection/disconnections and returning all items to original conditions.
- D. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching.
1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.

3.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities as directed by Architect.
1. Maintain temporary construction and support facilities until completion.
- B. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
- C. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.
- D. Field Offices for General Contractor & Inspector: Keep the office clean and orderly for use for project meetings. Field Office shall be cleaned weekly.
- E. Toilets: Use of the Owner's existing toilet facilities will not be permitted.
- F. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

- G. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
- H. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.
1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.
 4. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-labeled fire-retardant treated material for framing and main sheathing.
 5. Temporary enclosure where existing doors, glazing and frames are removed. Provide for Owner occupancy of these spaces where this work occurs.
 6. Temporary roofing as required to preserve and protect work done and allow work to proceed without project being delayed.
- I. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.
1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
 2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
 - a. Provide 48" x 48" sign indicating "Hard Hat Area", black/red on white.
 - b. Provide 24" x 24" sign at each project entrance indicating "Authorized Personnel Only--No Trespassing", white text on red background with 1" white border.
 - c. Provide temporary signs indicating disabled building access for each building during construction and allow for changes in access required by construction ways and means. Signs shall be 48" x 36", black/red text on white background with blue 1" border.
 - d. Provide a 24"x24" sign at each project entrance indicating "No Cats, Dogs or Pets Allowed", red text on white background with 1" red border.
- J. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
- K. Refuse: Refuse barrels shall be provided for workmen's lunch boxes, papers and debris. All rubbish shall be removed from the premises.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations." Comply with CFC Chapter 14 – Fire Safety during all phases of construction and demolition.
 - 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher per each 1000 square feet.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
 - 4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- B. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights. The Contractor shall provide, install and maintain for the duration of the work, as required, all lawful or necessary barricades and railings, lights, warning signs and signals, and shall take all other precautions as may be required to safeguard persons, the site and adjoining property, including improvements thereon, against injuries and damages of every nature whatsoever. The Contractor shall not obstruct required exitways of adjacent structures.
- C. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the entrance gates.
 - 1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.
- D. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
 - 1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- E. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment, which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
 - 1. Dust Control: The Contractor shall exercise precautionary measures to minimize dust

emissions which will include, but shall not be limited to, periodic sprinkling or wetting of the site, minimum of every day except as allowed by Architect. The Contractor has the option if using a dust palliative as specified in Caltrans 1981 Edition, Section 18.

- a. Fugitive dust shall be contained during earthwork activities by continuous sprinkling or wetting, as required, to bind soil to prevent fugitive dust. Roadways, walkways, construction areas and similar areas impacted by this project shall be maintained to prevent fugitive dust throughout the duration of project.
 - b. All unpaved haul roads shall be watered a minimum of twice per day, not limited to project site.
 2. Speed limit of vehicles on site shall not exceed 15 miles per hour and shall be under supervision of Contractor's Safety Representative, who shall evaluate field conditions and establish less speed as conditions change.
 3. Storm Water Prevention: Provide a Storm Water Prevention Plan as required by the required governing agency. Provide a Storm Water Prevention Plan for all construction activities of this project. Submit to governing agency and comply with all agency requirements. Comply and provide all mitigation measures in the governing agency approved Storm Water Prevention Plan. Coordinate plan with required HCP measures.
- F. Enclosure fence of construction areas outside Contractor's staging area/main working compound, where construction activity is beyond enclosure of construction area and duration of work in that area is 30 days or less, provide open-mesh plastic fencing with post and barricades. Fencing shall be maintained equal to enclosure fence above with gated access.

3.5 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
 2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Environmental Condition: This project will be occupied during construction. The Contractor shall provide fresh air to construction space total 1500 cfm for work space. Temporary duct modifications shall be made to prevent discharge of construction air into occupied spaces and maintain HVAC to occupied spaces. HVAC at construction area shall have a negative balance to prevent infiltration of construction air into any occupied areas. Construction area shall be aired out for 96 hours continually after all construction is complete and no material will be added that will cause vapors. After being aired out Contractor shall refit changes made to occupied spaces during construction and re-balance system to engineer's requirements.
- D. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary

facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.
2. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
 - a. Replace air filters.
 - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions. (Unusual conditions shall be defined as 10% of equipment life.)
 - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use (substantial shall be defined as 10% of bulb life of accepted industry average hours).

END OF SECTION 015000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Project Completion and Acceptance
 - 2. Inspection procedures.
 - 3. Project record document submittal(s).
 - 4. Operating and maintenance manual submittal(s).
 - 5. Submittal of warranties.
 - 6. Statement of extra materials delivered to Owner, accepted and signed by Owner
 - 7. Training attendees form
 - 8. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 0 through 33.
- C. See Division 1 Section "Governing Agency" for DSA Final Verified Reports to be filed.

1.3 PROJECT COMPLETION

- A. Contractor shall notify the Architect in writing when the project is acceptably completed; all work scope is done and ready for Project Inspector and Contractor to make a list of items to be corrected.
- B. The Project Inspector and Contractor shall make a list of items to be corrected and finish any items discovered incomplete. These items shall be completed and corrected prior to Architect and Consultants preparing a Final Inspection and Punch List Preparation. Contractor shall notify Architect in writing when all items are completed and corrected as well as items completed and corrected from Project Inspector and Contractor list of items previously prepared.
- C. Architect's field representatives (Architectural, Mechanical, Electrical, and other consultants) will make a field survey of the project to confirm that it has reached a state of completion, and items for "B" above have been done, in order to eliminate an unreasonably long Punch List on final inspection.
 - 1. All items in scope of work have been completed and accepted by Contractor and Project Inspector.
 - 2. All building systems are operational, tested and commissioned.
 - 3. Cleaning of building, grounds and related items completed except when approved by architect in writing in advance of field survey. Contractor's temporary measures

- may be left in place until final demobilization but a condition on removal for final payment processing.
4. Contractor to provide a written status update of project closeout check list.
- D. If not ready, the Architect will give the Contractor a written brief summary of what must be done for the project to be considered complete, enough for the Punch List preparation.
- E. When, in the opinion of the Architect, the job is ready for the Punch List preparation, a Punch List of items requiring completion and/or correction will be prepared. (This Punch List will be made as specific and complete as possible, and will include the listing of all specified closing items required of the Contractor, such as Record Drawings, maintenance manuals, written guarantees, etc.) Any items observed or noted subsequent to Punch List preparation, shall also be corrected prior to re-inspection, unless the Architect determined, in writing, that any such items properly fall into the category of work to be corrected during the warranty/guarantee period.
1. Architect's Punch List preparation will be scheduled and respective contractors, sub-contractors and vendors shall be present during the Punch List inspection. Sub-Contractors, contractors and vendors will be required to show operational status of items in project scope of each respective discipline.
 2. Mechanical, Electrical, and other consultants Punch List preparation will be scheduled and respective sub-contractor, contractors and vendors shall be present during the Punch List inspection. Sub-Contractors, contractors and vendors will be required to show operational status of items in project scope of each respective discipline.
 3. All Punch List items shall be completed and/or corrected before Contractor calls for Punch List re-inspection.
 - a. Architect shall be notified in writing by Contractor when all Punch List items are complete and project is ready for punch list back check by architect and consultants. Architect shall schedule punch list back check with contractor within 10 calendar days from receipt of written notice from Contractor.
 - b. Architect will allow contractor two, (2), punch list back check visits of all items. Any additional site visits for items not completed and acceptable to Architect after second site visit will charged to the contractor as a negative change order for time spent by Architect to do re-inspections and office related work including reimbursable expenses incurred due to additional site visits.

1.4 PROJECT ACCEPTANCE AND NOTICE OF COMPLETION

- A Notice of Completion will not be prepared nor moved forward for Owner approval until all of the following are complete:
1. Project Closeout 100% complete.
 2. Punch list items 100% complete.
 3. Record documents approved and delivered.
 4. All warranties and guarantees have been delivered and accepted by Owner and Architect.
 5. Training complete.
 6. The contractor(s) final verified report is filed with the Division of State Architect of the Department of General Services.
 7. OWNER is able to occupy all portions of the project as intended on Construction Documents.
 8. Contractor in direct contract with the owner upon completion of work shall execute

certifications as follows:

- a. Asbestos Certification shall be used for documentation of non-asbestos materials used in project.
 - b. PCB Certification shall be used for documentation of non-PCB materials used in project.
 - c. Lead Certification shall be used for documentation of non-lead materials used in project.
 - d. In-Service Certification Forms shall be used for all documentation of in-service activities. Copies of forms shall be included in maintenance and operation manuals.
 - e. Prevailing Wage Certification shall be used for conformation/certification that prevailing wage were paid for this project.
 - f. Affidavit of Payment of Debts and Claims and Release of Stop Notices shall be notarized and submitted as part of the project closeout requirement.
 - g. Extra Materials Receipt shall be signed by College M&O Director.
 - h. Training Attendees Form shall be completed by College staff attendees and acknowledged by the Project Inspector.
- B. Notice of Completion shall be prepared and approved by Owner prior to recording. The official project acceptance date shall be the date of Owner acceptance of the project and authorization to filing of the Notice of Completion. Owner shall record Notice of Completion within 10 days of acceptance of project as being complete. All warranties start dates will be Date of recordation of Notice of Completion.
- C. The project shall be accepted by the Owner who shall authorize after acceptance of the project the subsequent filing of the Notice of Completion. The final payment shall be made thirty-five (35) days from the date of recordation of the Notice of Completion, provided that: The Contractor shall furnish satisfactory evidence that all claims for labor and materials have been paid and that no claims shall have been presented to the Owner by any person or persons based upon any act or omission of the Contractor, and no Stop Notices or claims shall have been filed against said work or the property whereon it was done.
1. The Contractor in direct contract with the Owner must record and file with the Owner an Affidavit of Payment of Debts and Claims and Release of Stop Notices prior to request for project acceptance is considered by the Board of Trustees. By this document, the contractor hereby certifies that on date of document recordation, he/she has been paid in full less retainage for all materials and equipment furnished, for all labor and services performed, and for all known indebtedness and claims against the undersigned for damages arising in any manner on or against the Project, its land, improvements, and equipment of any kind.
 2. All others not limited to sub-contractors, lower tier contractors, suppliers, vendors and others providing services, materials, equipment and related items must record their liens and serve owner stop notice within thirty (30) days of the date the Notice of Completion is recorded to place and person indicated in project manual herein. (Civil Code §3116).

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of black line white-prints of Contract

Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with erasable pencil.
 2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
 3. Note related Change Order numbers where applicable.
 4. Submit one copy of record drawing for Architect's review.
 - a. Show all underground utility locations and routings by horizontal and vertical dimensions.
 - b. Show all overhead utility locations and routings by horizontal and vertical dimensions.
 - c. Clearly indicate at each affected detail and other Drawings a full description of changes made during construction. Call attention to each entry by drawing a "cloud" around the area(s) affected.
 5. Once reviewed and approved by the Architect, organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set. Provide Owner with two (2) copies black and white, original (1), original red-lined with changes and two flash drives of scanned black and white copies.
- C. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.
1. Upon completion of mark-up, submit one complete set of record Product Data to the Architect for the Owner's records.
- D. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
- E. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.

1.6 PROJECT CLOSEOUT BINDER(S) SUBMITTAL

- A. Submit requirements per project manual section(s) one copy in a binder(s) and two (2)

copies of scanned data in binders on flash drives. See Project Closeout form at the end of this section for additional requirements. Note that this form shall be updated with additional materials and sections once Contractor starts submitting closeout documents to include issued addenda, RFPs, FCDs and other items added in the bid document during construction. All required number of years for warranty shall be provided by the Contractor. In the event this conflicts with manufacturer's warrant, more restrictive will prevail. If manufacturer will not meet requirements, Contractor shall take full responsibility for additional warranty requirement above what manufacturer will provide.

1. Binder(s)
 - a. Part 1 - Technical Sections
 - 1) Organize sections items per CSI Format descending order.
 - b. Part 2 - General Requirement items
 - 1) Tab in order per project list herein at end of this section.
2. Binder(s) shall have cover sheet inserted in front face and side label. Cover sheet shall have the following information:
 - a. Project name
 - b. College name
 - c. Date of Notice of Completion
 - d. Labeled "Part 1", in the event of multiple binders for a Part, add volume number and list sub-binders on title sheet with name of each specific binder.
 - e. General Contractor's name.
 - f. Index of items in binder.
3. Labeled divider tabs shall be provided for each section as listed on index on cover.
4. Each applicable section will have the following documents in order:
 - a. Subcontractor's Warranty
 - b. Product data
 - c. Manufacturer's warranty
 - 1) Each installed equipment, especially for Divisions 21, 22, 23 and 26, shall have warranties from manufacturers with project name stated in the certificate. All forms submitted to the manufacturers to secure warranty shall be enclosed as part of project closeout.
 - d. Proposal for continuing services and/or post construction inspection dates – if applicable
 - e. Tests/ reports/ certifications/ agreement between Contractor/ Manufacturer/ Subcontractor to repair and replace
 - f. Shop drawings
 - g. Cleaning data
 - h. Receipt of extra material acceptance by the M & O director – see form at the end of section
 - i. Training attendees' form – see form at the end of section
 - j. Other document required:

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- 1) Maintenance data
- 2) Emergency Instructions
- 3) Spare parts lists
- 4) Wiring diagram
- 5) Inspection procedure
- 6) Recommended "turn around cycles"
- 7) Lubricants, special tools
- 8) Control sequences
- 9) Hazards
- 10) Fixture lamping schedule
- 11) Proof of training for equipment operation with list of attendees from College staff

C. Submit general requirements in another binder.

1. Binder shall have a cover sheet and side label. Cover shall have the following information:
 - a. Project name
 - b. College name
 - c. Date of Notice of Completion
 - d. Labeled "Part 2"
 - e. General Contractor's name
2. Binder shall have table of contents. This binder will contain the following:
 - a. Demobilization information with General Contractor's Letterhead and signed by Project Manager.
 - 1) Indicate dated for the following information:
 - a) Removal of temporary office
 - b) Removal of temporary fence barricades
 - c) Disconnect/safing temporary utilities
 - d) Repair temporary staging to pre-construction or specified condition
 - e) Removal of temporary toilets
 - f) Removal of miscellaneous construction debris/ excess materials
 - g) Removal of project sign, deliver to Owner if requested
 - h) Removal of miscellaneous project signs
 - i) Removal of trash dumpster
 - b. Instructions for Operating equipment signed off by College Staff (see Project Closeout form) with General Contractor's Letterhead and signed by Project Manager.
 - c. Certification of no asbestos used or substituted
 - d. Certification of no lead containing products used or substituted
 - e. Certification of no PCB containing products used or substituted
 - f. Certification of substitutions made on project, if none state so
 - g. All substitution products shall be listed and shall indicate substitution number and date approved by the Architect.
 - h. Notarized affidavit of payment of debts and claims and release of stop notices

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- i. Prevailing wage reports/ documents
- j. Verified DSA report
- k. Consent of surety to final payment
- l. Statement of final liquidated damages settlement
- m. Final utility meter readings signed by Project Inspector

1.7 PROJECT CLOSEOUT NOTIFICATION, SURETY NOTIFICATION

- A. If requested in writing, the contractor will be given a project Close-out check list of items to be completed prior to project being accepted as complete. Contractor shall start project closeout no later than 90% completion of project and be complete prior to project punch list preparation/walk. This is contractor's first notice. Notice of Completion will not be filled until project closeout is complete.
- B. The contractor will be given a 20 calendar day notification that the project closeout is incomplete and notification that owner will complete project closeout work incomplete and assess contractor additional architectural and engineering fees incurred completing work not complete and per construction documents. Copy will be sent to surety.
- C. The contractor will be given a final 10-day notice to complete all project closeout items. The estimated amount of costs will be indicated therein that the owner will be spending for completing the project closeout. Items done by the owner and additional architect's fees will be deducted from funds due contractor. Copy will be sent to surety.
- D. If project closeout is not complete after deadline in Item "C" above, the notice of completion will be filed listing incomplete items. Owner will complete project closeout and deduct cost incurred from funds held. Balance of funds will be distributed per Contract Documents. Surety will be notified of actions taken.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
 - 1. Maintenance manuals.
 - 2. Record documents.
 - 3. Spare parts and materials.
 - 4. Tools.
 - 5. Lubricants.
 - 6. Fuels.
 - 7. Identification systems.
 - 8. Control sequences.
 - 9. Hazards.
 - 10. Cleaning.

11. Warranties and bonds.
 12. Maintenance agreements and similar continuing commitments.
- B. As part of instruction for operating equipment, demonstrate the following procedures:
1. Start-up.
 2. Shutdown.
 3. Emergency operations.
 4. Noise and vibration adjustments.
 5. Safety procedures.
 6. Economy and efficiency adjustments.
 7. Effective energy utilization.

3.2 FINAL CLEANING

- A. General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
1. Complete the following cleaning operations before requesting inspection for Certification of Notice of Completion.
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

3.3 FORMS

- A. In-Service Certification Forms shall be used for all documentation of in-service activities. Copies of forms shall be included in maintenance and operation manuals.

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- B. Asbestos Certification shall be used for documentation of non-asbestos materials used in project.
- C. PCB Certification shall be used for documentation of non-PCB materials used in project.
- D. Lead Certification shall be used for documentation of non-lead materials used in project.
- E. Prevailing Wage Certification shall be used for conformation/certification that prevailing wage were paid for this project.
- F. Affidavit of Payment of Debts and Claims and Release of Stop Notices shall be notarized and submitted as part of the project closeout requirement.
- G. Project Closeout Liquidated Damages Contract Sum-Days Calculation shall be used for liquidated damages computation.
- H. Extra Materials Receipt shall be used for documentation of extra materials required by construction document; to be submitted to College M&O Director.
- I. Training Attendees Form shall be used for documentation of College staff that participated in the training scheduled and coordinated by the Contractor.

IN-SERVICE CERTIFICATION

Specification Section No. _____

Project: _____

Date: _____

Owner: _____

Architect: _____

File No: _____

Contractor: _____

Project No: _____

Inspector: _____

DSA Application No: _____

In-Service Conducted By: _____

Materials Reviewed: (Check Applicable Boxes)

☐ Record Drawings

☐ Safety Procedures

☐ Controls Manipulation

☐ Warranties

☐ Cleaning Procedures

☐ Emergency Procedures

☐ Maintenance Agreement

☐ Identification Systems

☐ Noise/Vibration

☐ Operation & Maintenance

☐ Start-Up

Adjustment

Manuals

☐ Control Sequences

☐ Effective Energy

☐ Special Tools and Parts

☐ Shut Down

Utilization

Attendees (Please print name and sign below)

1. District Facilities

Representative

2. Site Representative

3. District Maintenance

Representatives

(Plumbing)

(Mechanical)

(Electrical)

(Grounds)

4. Others Present (P.I.

General Contractor)

Meeting Date _____ Time of Start _____ Time of Completion _____

I certify that the above named in-service covered all aspects of the specialty for which it was convened.

Signature _____ Date _____

ASBESTOS CERTIFICATION

Specification Section No. _____

Project:	_____	Date:	_____
Owner:	_____		
Architect:	_____	File No:	_____
Contractor:	_____	Project No:	_____
Inspector:	_____	DSA Application No:	_____

To: _____

From: _____

Subject: **Asbestos Containing Building Materials Letter**

I hereby certify that, to the best of my knowledge, the materials furnished and/or installed

by _____ or its
(Name of Contractor)

subcontractor for _____ located at
(Name of Project)

_____ do not contain Asbestos-
(Project Address)

Containing Building Materials.

Signed: _____

Position: _____

Dated: _____

PCB CERTIFICATION

Specification Section No. _____

Project:	_____	Date:	_____
Owner:	_____		
Architect:	_____	File No:	_____
Contractor:	_____	Project No:	_____
Inspector:	_____	DSA Application No:	_____

To: _____

From: _____

Subject: **PCB-Containing Building Materials Letter**

I hereby certify that, to the best of my knowledge, the materials furnished and/or installed

by _____ or its
(Name of Contractor)

subcontractor for _____ located at
(Name of Project)

_____ do not contain PCB-
(Project Address)

Containing Building Materials.

Signed: _____

Position: _____

Dated: _____

LEAD CERTIFICATION

Specification Section No. _____

Project:	_____	Date:	_____
Owner:	_____		
Architect:	_____	File No:	_____
Contractor:	_____	Project No:	_____
Inspector:	_____	DSA Application No:	_____

To: _____

From: _____

Subject **Lead Containing Building Materials Letter**

I hereby certify that, to the best of my knowledge, the materials furnished and/or installed

by _____ or its
(Name of Contractor)

subcontractor for _____ located at
(Name of Project)

_____ do not contain Lead-
(Project Address)

Containing Building Materials.

Signed: _____

Position: _____

Dated: _____

PREVAILING WAGE CERTIFICATION

Project:	_____	Date:	_____
Owner:	_____		
Architect:	_____	File No:	_____
Contractor:	_____	Project No:	_____
Inspector:	_____	DSA Application No:	_____

To: _____

From: _____

Subject **Prevailing Wage Certification Letter**

I hereby certify that, all payments made to employees of Contractor and subcontractors are based on prevailing wage per Article 2 Chapter 1, Part 7, Division 2 of the California Labor Code and all contractors and subcontractors did furnished electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement). Prevailing wage records for each pay request processed are on file and available upon request. Contact _____
(Name of Contact Person)

with _____ to request copies. Contact number is
(Contractor's Name)

_____ and office address is located at _____
(Office number)

_____.
(Contractor's Address)

Signed: _____

Position: _____

Dated: _____

AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS AND RELEASE OF STOP NOTICES

Project:	_____	Date:	_____
Owner:	_____		
Architect:	_____	File No:	_____
Contractor:	_____	Project No:	_____
Inspector:	_____	DSA Application No:	_____

By this instrument, the undersigned hereby certifies that on this date, he/she has been paid in full less retainage for all materials and equipment furnished, for all labor and services performed, and for all known indebtedness and claims against the undersigned for damages arising in any manner on or against the PROJECT, its land, improvements, and equipment of any kind. Therefore, the undersigned does hereby waive and/or release any and all claims and/or stop notices against the PROJECT as of the _____ day of _____, in the year of 20____.

COMPANY: _____

BY: _____

TITLE: _____

STATE OF _____

COUNTY OF _____

Before me the undersigned authority on this date personally appeared _____, Known to me to be the person whose name is subscribed to the foregoing instrument, and being first duly sworn, acknowledged to me that he executed the same for the purposes and consideration therein expressed and declared to me that the statements contained therein are true.

Sworn and subscribed to before me this _____ day of _____ year of 20____.

Notary Public in and for said
State and County

My commission expires: _____

PROJECT CLOSEOUT LIQUIDATED DAMAGES CONTRACT SUM-DAYS CALCULATION

Project: _____ Date: _____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

Contract Days Actual			
	Original Contract Duration (Calendar Days)		
	Approved Change Orders (Calendar Days)		
	Adjusted Contract Days		
Liquidated Damages			
	Project Start Date		
	Project Completion Date	Actual Construction Days	
	Liquidated Damages/Day	Difference Actual - Actual	
	Liquidated Damages (Dollars)		
Contract Sum			
	Original Contract Sum (Dollars)		
	Approved Change Orders (Dollars)		
	Adjusted Contract Sum		
	Paid to Date		
	Retention withheld to date		
	Total Paid to date including Retention		
Adjusted Contract Sum			
	Balance Contract Sum less Total Paid to Date/Retention		
	Liquidated Damages		
	Testing/Inspections Back-Charges		
	Unused Allowances		
	Special Holdouts		
	Balance		
Stop Notices			
	Stop Notice amount x \$150%		
	Total		

EXTRA MATERIALS RECEIPT

Specification Section No. _____

Project: _____

Date: _____

Owner: _____

Architect: _____

Contractor: _____

Inspector: _____

File No: _____

Project No: _____

DSA Application No: _____

List of Materials to surrender to M&O office/Director:

Item #	Qty.	Description

I certify that the above extra materials are all in good condition and meet the required quantity per construction documents.

Submitted by:

Signature _____ Date _____

Received by:

Signature _____ Date _____

TRAINING ATTENDEES FORM

Specification Section No. _____

Project: _____

Date: _____

Owner: _____

Architect: _____

Contractor: _____

Inspector: _____

File No: _____

Project No: _____

DSA Application No: _____

Subject: _____

Location: _____

Description of Training: _____

List of Attendees:

Name	Department	Signature

Submitted by:

Signature _____

Contractor

Date _____

Acknowledged by:

Signature _____

Project Inspector

Date _____

PROJECT CLOSEOUT CHECKLIST

pub. rev. 04/05/04

PROJECT: New Kindergarten Project
PROJECT NO: 394-0010
CONTRACTOR: _____

DATE INITIAL REQUEST: _____

DATE DUE BACK: _____

STATUS: _____

- ☒ **Initial request for documents**
- ☐ **Incomplete see below**
- ☐ **Accepted as complete**
- Date completed:** _____

LEGENDS:

- C** - Contractor
- S** - Subcontractor
- O** - Owner
- A** - Architect
- E** - Engineer
- PI** - Project Inspector
- M** - Manufacturer

PROJECT CLOSEOUT

PART 1- General Closeout Items

Provide information as required in the Project Manual. See checklist below for items required. Tabulate each section and provide information required.

1. Project identification sheets
 - a. Project name, location, date of start/completion of construction
 - b. Copy of Completed Project Closeout Checklist
 - c. Copy of Notice of Completion
2. Project contacts, names, address, phone numbers, fax number, email and web sites.
 - a. General contractor
 - b. Sub-contractors/lower tier sub-contractors
 - 1) List by CSI format
 - c. Suppliers direct to Contractor
3. Project Warranties
 - a. List by CSI format
4. Maintenance Agreements
 - a. List by CSI format
5. Record Drawings flash drive
 - a. Plastic sleeve with record drawings scanned to flash drive.
6. Forms
 - a. In-Service Certification Forms shall be used for all documentation of in-service activities. Copies of forms shall be included in maintenance and operation manuals.
 - b. Asbestos Certification shall be used for documentation of non-asbestos materials used in project.
 - c. PCB Certification shall be used for documentation of non-PCB materials used in project.
 - d. Lead Certification shall be used for documentation of non-lead materials used in project.
 - e. Affidavit of Payment of Debts and Claims and Release of Stop Notices shall be notarized and submitted as part of the project closeout requirement.
 - f. Affidavit of Substitutions shall be notarized and submitted as part of the project closeout requirement.
 - g. Extra Materials Receipt shall be used for documentation of extra materials required by construction. document; to be submitted to M&O Director.
 - 1) Provide form for each material by Technical Section
 - h. Training Attendees Form shall be used for documentation of College staff that participated in the training scheduled and coordinated by the Contractor.

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- 1) Provide form for each material by Technical Section.

PART 2 - Technical Section Close out items

Provide information as required in technical section of the Project Manual. See checklist below for items required. Tabulate each section and provide information required. Warranty information will be provided in Binder one under tab 3 and also in each technical section. Information requested herein shall be the minimum requirements.

SECTION	SECTION NAME	BY	DATE COMPLETED
002113	INSTRUCTION TO BIDDERS		
	Copy of Dust Control Plan Sections 1-6 (submitted to Region Office)	<u>C</u>	<u> </u>
	Copy of submitted San Joaquin Valley Air Pollution form	<u>C</u>	<u> </u>
014000	QUALITY CONTROL SERVICES		
	Weigh Master Certificate	<u>S</u>	<u> </u>
018000	CONSTRUCTION WASTE REDUCTION/ DISPOSAL & RECYCLING		
	Construction Waste Management Plan	<u>C</u>	<u> </u>
	Construction Waste Management Worksheet(s)	<u>C</u>	<u> </u>
	Construction Waste Management Acknowledgement	<u>C</u>	<u> </u>
033000	CAST-IN –PLACE CONCRETE		
	Warranty – 15 years for concrete sealer/hardener/curing compound	<u>M</u>	<u> </u>
101423	SIGNS		
	Cleaning and maintenance data	<u>S</u>	<u> </u>
	Warranty - 5 years	<u>S</u>	<u> </u>
101426	EXTERIOR POST AND PANEL SIGNS		
	Cleaning and maintenance data	<u>S</u>	<u> </u>
	Warranty 5 years	<u>S</u>	<u> </u>
260000	ELECTRICAL		
	Operating instructions & maintenance procedure	<u>S</u>	<u> </u>
	Field Test Reports approved by Electrical Engineer	<u>S</u>	<u> </u>
	Servicing instructions	<u>S</u>	<u> </u>

PART 3 - Specific Close out items

RECORD DRAWINGS –Full size drawings.

Provide original red lined record drawings, full size and one (1) black and white copy, full size. Provide two copies, (2) on flash drive of digitally color scanned record drawings.

CONTRACTOR DSA CLOSE OUT REQUIREMENTS:

Weight master certificates for Concrete	<u>C</u>	<u> </u>
Verified DSA Reports	<u>C</u>	<u> </u>

PREVAILING WAGE CERTIFICATION:

Prevailing Wage Certification: Statement shall be used for	<u>C</u>	<u> </u>
--	----------	-----------------------------

conformation/certification that prevailing wage were paid for this project. _____

PART 4 – Final Payment

FINAL PAYMENT:

The following items shall be completed and accepted prior to acceptance of final pay request and consideration for payment by owner. All the above items shall be complete and accepted by Architect and Owner

Affidavit of Payment of Debts and Claims and Release of Stop Notices

C

Consent of Surety to Final Payment

C

Final Liquidated Damages settlement statement

C

Final Pay Request

C

File Notice of Completion

O

END OF SECTION 017700

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
 - 1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.
 - 2. General closeout requirements are included in Section "Project Closeout."
 - 3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions 2 through 33.
 - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
 - 5. Items that are omitted and/or different than specified/indicated herein and on Construction Documents and items not indicated as a change on Submittals, shall be warranted as required in Sections 006002 and 013300.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- C. Notwithstanding any tests, approvals, certificates, commissioning, inspection or otherwise by the Owner, Architect or any other consultant employed by or on behalf of the employer, the Contractor shall be and remain fully and exclusively responsible and liable for ensuring that his works, and all goods and materials therein are in every respect and detail in accordance with the Contract Documents, and no such tests, approval certificates, commissioning, inspection or otherwise shall in any way diminish or negate the Contractor's responsibility or liability as foresaid.

1.3 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
 - 1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- E. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.4 SUBMITTALS

- A. Submit written warranties to the Architect prior to the date certified for Notice of Completion. If the Architect's Certificate of Notice of Completion designates a commencement date for warranties other than the date of Notice of Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.
 - 1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen days of completion of that designated portion of the Work.
- B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.
 - 1. Refer to individual Sections of Divisions 2 through 33 for specific content requirements, and particular requirements for submittal of special warranties.
- C. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
 - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
 - 2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor.
 - 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable).

PART 3 – EXECUTION

3.1 FORMS

- A. Project Warranty Form, see attached.
- B. Subcontractor Warranty Form, see attached.

END OF SECTION 017800

PROJECT WARRANTY

Project: New Kindergarten Project

Date:

Avenal Elementary

Owner: Reef-Sunset Unified School District

Architect: AP Architects

Contractor:

Inspector:

File No:

Project No:

DSA Appl No:

_____(Contractor) hereby warrants to the Owner that materials and equipment furnished under the Contract in the _____ (Name of Project) are of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work is free from defects not inherent in the quality required or permitted, and that the Work conforms with the requirements of the Contract Documents. Work not conforming to these requirements, including substitution not properly approved and authorized, may be considered defective. This warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.

If, within ____ year(s) after the date of Notice of Completion of the Work or designated portion thereof, or by terms of an applicable special warranty required by the Contract Documents extending this time period, and of the Work is found to be not in accordance with the requirements of the Contract Documents or proves to be defective in materials or workmanship, the Contractor expressly agrees to correct it, without expense to the Owner, promptly after receipt of written notice from the Owner or his agent to do so unless the Owner has previously given the Contractor written acceptance of the condition. This period of ____ year(s) shall be extended with respect to portions of the Work first performed after Notice of Completion by the period of time between Notice of Completion and the actual performance of Work. This obligation of the Contractor to correct the Work shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

Nothing contained in this warranty shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the time period of ____ year(s), or special extended time periods required by the Contract Documents, for correction of the Work as described above relates only to the specific obligation of the Contractor to correct the work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

In the event of the Contractor's failure to comply with the conditions of this warranty within 5 days after being notified in writing by the Owner or his agent, the Contractor hereby authorizes the Owner to proceed to have said defects repaired and made good at the Contractor's expense and the Contractor will honor and pay the costs and charges therefore upon demand.

The term "Work" means the construction and services required by the Contract Documents and includes all other labor, materials, equipment and services provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or part of the total construction performed under the Contract Documents.

Date _____

Contractor

Address

Telephone

Signature of Contractor

Title

SUBCONTRACTOR WARRANTY

Project: New Kindergarten Project

Date:

Avenal Elementary

Owner: Reef-Sunset Unified School District

Architect: AP Architects

File No:

Contractor:

Project No:

Inspector:

DSA Appl No:

____ (Subcontractor) hereby warrants to _____ (General Contractor) that materials and equipment furnished under the Contract, pursuant to Specifications Section(s) _____ in the _____ (Name of Project) are of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work is free from defects not inherent in the quality required or permitted, and that the Work conforms with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. This warranty excludes remedy or damage or defect caused by abuse, modifications not executed by the Subcontractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.

If, within ____ year(s) after the date of Notice of Completion of the Work or designated portion thereof, or by terms of an applicable special warranty required by the Contract Documents extending this time period, and of the Work is found to be not in accordance with the requirements of the Contract Documents or proves to be defective in materials or workmanship, the Subcontractor expressly agrees to correct it, without expense to the Owner, promptly after receipt of written notice from the Contractor to do so unless the Owner has previously given the Contractor written acceptance of the condition. This period of ____ year (s) shall be extended with respect to portions of the Work first performed after Notice of Completion by the period of time between Notice of Completion and the actual performance of Work. This obligation of the Subcontractor to correct the Work shall survive acceptance of the Work under the Contract and termination of the Contract. The Contractor shall give such notice promptly after discovery of the condition.

Nothing contained in this warranty shall be construed to establish a period of limitation with respect to other obligations which the Subcontractor might have under the Contract Documents. Establishment of the time period of ____ year(s), or special extended time periods required by the Contract Documents, for correction of the Work as described above relates only to the specific obligation of the Subcontractor to correct the work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Subcontractor's liability with respect to the Subcontractor's obligations other than specifically to correct the Work.

In the event of the Subcontractor's failure to comply with the conditions of this warranty within 5 days after being notified in writing by the Contractor, the Subcontractor, hereby authorizes the Contractor to proceed to have said defects repaired and made good at the Subcontractor's expense and the Subcontractor will honor and pay the costs and charges therefore upon demand.

The term "Work" means the construction and services required by the Contract Documents and includes all other labor, materials, equipment and services provided by the Subcontractor to fulfill the Subcontractor's obligations. The Work may constitute the whole or part of the total construction performed under the Contract Documents.

Date _____

Contractor

Address

Telephone

Signature of Contractor

Title

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.
 - 1. Standard details and requirements per jurisdiction requirements, not limited to herein.

1.2 SUMMARY

- A. This Section includes, but not limited to, construction waste diversion and related items.
 - 1. Establish a Construction Waste Management (CWM) plan for the diverted materials, or meet local construction and demolition waste management ordinance, whichever is more stringent.
 - 2. Construction Waste Management (CWM) worksheet(s).
 - 3. Construction Waste Management (CWM) acknowledgement.
 - 4. Miscellaneous and related forms as required by local jurisdiction and Owner.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Project Closeout" for required closeout documents.
 - 2. Division 2 Section "Selective Demolition" for related items.

1.3 SUBMITTAL

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
 - 1. Construction Waste Management Plan.
 - 2. Construction Waste Management Worksheet(s).
 - 3. Construction Waste Management Acknowledgement.
 - 4. Copies of all applications, permits and related requirements, not limited to, herein and local jurisdiction requirements.
 - 5. Project Closeout Requirements:
 - a. Copies of all completed forms required herein
 - b. Compilation of Construction Waste Management (CWM) worksheet(s).

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. Title 24, Part 1 CCR 2013, Chapter 5 (California Green Building Standard Code)
- B. Refer to Division 2 Section "Selective Demolition", for additional requirements.
- B. Refer to Division 2 Section "Building Demolition" for additional requirements.

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PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

- A. Construction waste diversion. Establish a construction waste management plan for the diverted materials, or meet local construction and demolition waste management ordinance, whichever is more stringent.
- B. Construction waste management plan (CWMP). Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan for approval by the District that:
 - 1. Identifies the materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
 - 2. Determine if materials will be sorted on-site or mixed.
 - 3. Identifies diversion facilities where materials collected will be taken.
 - 4. Specifies that the amount of materials diverted shall be calculated by weight or by volume, but not both.
 - 5. See sample forms at end of section.
- C. Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with herein. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the District and Architect.
- D. Construction waste reduction of at least 50 percent. Recycle and/ or salvage for reuse a minimum of 50 percent of the non- hazardous construction and demolition debris, or meet a local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or volume, but not both.

Exceptions:

- 1. Excavated soil and land-clearing debris.
- E. Excavated soil and land clearing debris. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed, if approved by the District and Architect within 30 days of Notice to Proceed.

3.2 DISPOSAL OF WASTE/ DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally disposed off site per Construction Waste Management Plan.
 - 1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
 - 2. Burning of removed materials is not permitted on project site.
- B. Demolition Permits and Disposal Requirements (Sample forms at end section):
 - 1. The District requires diversion of 50% of discarded materials from landfills, reusing for compliance with AB 939 goals. Contractor shall secure a demolition permit with local jurisdiction as prescribed in Section 002113 "Instructions to Bidders". The following requirements are:

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- a. Prepare Construction Waste Management Plan.
- b. Provide for all Contractor, subcontractor, vendor, workers a Construction Waste Management Acknowledgement. Keep files at project site. Provide copies for Project Closeout.
- c. Complete Construction and Demolition Recycling Program Application as required by local jurisdiction. Verify requirements prior to bidding.
- d. Inform all sub-contractors, vendors and employees about the recycling requirements, as Contractor will be held responsible for any materials they take away from the job site. Document acknowledgement with Construction Waste Management Acknowledgement Report. In order for Contractor to comply with recycling requirements, vendors, employees and subcontractors must take materials to an approved disposal/ recycling site and keep copies of disposal tickets for diversion rate.
 1. Track waste by weight or volume, but not both.
- e. Compliance: District will not accept project until it is determined that the Construction and Demolition waste/disposal has fully complied with the diversion requirements and recycling guidelines.
- f. Non-Compliance: If the Contractor fails to adhere to the Construction and Demolition Recycling Plan, the applicant will not receive project acceptance.
- g. Contractor shall complete a Construction Waste Management Worksheet for documenting compliance with the Waste Management Plan after completion of project, as a precedent to project acceptance.

B. Demolition Permits and Disposal Requirements:

1. The local jurisdiction requires diversion of 50% of discarded materials from landfills, reusing for compliance with AB 939 goals. Contractor shall secure a demolition permit as prescribed in Section 002113 "Instructions to Bidders". The following requirements are:
 - a. Complete Construction and Demolition Recycling Program Application.
 - b. The franchise hauler Mid Valley Disposal shall be the exclusive service provider for roll-off service and shall transport the Construction and Demolition material to their transfer station located at 15300W. Jensen Avenue, Kerman, California, for all projects that require a permit to build or deconstruct to spate material and divert a minimum of fifty percent (50%) of Construction and Demolition material form projects. Inform all sub-contractors, vendors and employees about the recycling requirements, as Contractor will be held responsible for any materials they take away from the job site. In order for Contractor to comply with recycling requirements, vendors, employees and subcontractors must take materials to Mid Valley Disposal and keep copies of weight tickets for diversion rate.
 - c. Compliance: If the local entity determines that the Construction and Demolition has fully complied with the diversion requirements and recycling guidelines, the local entity will provide final inspection and/or certificate of occupancy.
 - d. Non-Compliance: If the Contractor fails to adhere to the Construction and Demolition Recycling Plan, the applicant will not receive final inspection and/or certificate of occupancy.
 - e. Contractor shall complete a Waste Reduction and Recycling Report (WRRR) after completion of project, as a precedent to final inspection and/or issuance of any certificate of occupancy is approved by local entity.

END OF SECTION 018000

CONSTRUCTION WASTE MANAGEMENT (CWM) PLAN

Note: This sample form may be used to assist in documenting compliance with the waste management plan.

Project Name: _____
Job #: _____
Project Manager: _____
Waste Hauling Company: _____
Contact Name: _____

All Subcontractors shall comply with the project's Construction Waste Management Plan.

All Subcontractor foremen shall sign the CWM Plan Acknowledgement Sheet.

Subcontractors who fail to comply with the Waste Management Plan will be subject to backcharges or withholding of payment, as deemed appropriate. For instance, Subcontractors who contaminate debris boxes that have been designed for a single material type will be subject to backcharge or withheld payment, as deemed appropriate.

1. The project's overall rate of waste diversion will be _____ %.
2. This project shall generate the least amount of waste possible by planning and ordering carefully, following all proper storage and handling procedure to reduce broken and damaged material and reusing materials whenever possible. The majority of the waste that is generated on this jobsite will be diverted from the landfill and recycled for other use.
3. Spreadsheet 1, enclosed, identifies the waste materials that will be generated on this project, the diversion strategy for each waste type and the anticipated diversion rate.
4. Waste prevention and recycling activities will be discussed at the beginning of weekly subcontractor meetings. As each new subcontractor comes on-site, the WMP Coordinator will present him/her with a copy of the CWM Plan and provide a tour of the jobsite to identify materials to be salvaged and the procedure for handling jobsite debris. All Subcontractor foremen will acknowledge in writing that they have read and will abide by the CWM Plan. Subcontractor Acknowledgement Sheet enclosed. The CWM Plan will be posted at the jobsite trailer.
5. Salvage: Excess materials that cannot be used in the project, nor returned to the vendor, will be offered to site workers, the owner, or donated to charity if feasible.
6. _____ [HAULING COMPANY] will provide a commingled drop box at the jobsite for most of the construction waste. These commingled drop boxes will be taken to [Sorting Facility Name and Location]. The average diversion for commingled waste will be _____%. As site conditions permit, additional drop boxes will be used for particular phases of construction (e.g. concrete and wood waste) to ensure the highest waste diversion rate possible.
7. In the event that the waste diversion rate achievable via the strategy described in (6) above, is projected to be lower than what is required, then a strategy of source-separated waste diversion and/or waste stream reduction will be implemented. Source separated waste refers to jobsite waste that is not commingled but is instead allocated to a debris box designated for a single material type, such as clean wood or metal.
Notes:
 - a. Waste stream reduction refers to efforts taken by the builder to reduce the amount of waste generated by the project to below four (4) pounds per square foot of building area.
 - b. When using waste stream reduction measures, the gross weight of the product is subtracted from the base weight of four (4) pounds per square foot of building area. This reduction is considered additional diversion and can be used in the waste reduction percentage calculations.
8. _____ [HAULING COMPANY] will track and calculate the quantity (in tons) of all waste leaving the project and calculate the waste diversion rate for the project. [HAULING COMPANY] will provide Project Manager with an updated monthly report on gross weight hauled and the waste diversion rate being achieved on the project. [HAULING COMPANY's] monthly report will track separately the gross weights and diversion rates for commingled debris and for each source -separated waste stream leaving the project. In the event the [HAULING COMPANY] does not service any or all of the debris boxes on the project, the [HAULING COMPANY] will work with the responsible parties to track the material type and weight (in tons) in such debris boxes in order to determine waste diversion rates for these materials.
9. In the event that the Subcontractors furnish their own debris boxes as part of their scope of work, such Subcontractors shall not be excluded from complying with the CWM Plan and will provide [HAULING COMPANY] weight and waste diversion data for their debris boxes.
10. In the event that site use constraints (such as limited space) restrict the number of debris boxes that can be used for collection of designed waste the project Superintendent will, as deemed appropriate, allocate specific areas onsite where individual material types are to be consolidated. These collection points are not to be contaminated with non-designated waste types.
11. Debris from jobsite office and meeting rooms will be collected by [DISPOSAL SERVICE COMPANY]. [DISPOSAL SERVICE COMPANY] will, at a minimum recycle office paper, plastic, metal and cardboard.

CONSTRUCTION WASTE MANAGEMENT (CWM) WORKSHEET

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Note: This sample form may be used to assist in documenting compliance with the waste management plan.

Project Name: _____			
Job Name: _____			
Project Manager: _____			
Waste Hauling Company: _____			
Construction Waste Management (CWM) Plan			
WASTE MATERIAL TYPE	DIVERSION METHOD		PROJECTED DIVERSION RATE
	COMMINGLED AND SORTED OFF SITE	SOURCE SEPARATED ON SITE	
Asphalt			
Concrete			
Shotcrete			
Metals			
Wood			
Rigid Insulation			
Fiberglass Insulation			
Acoustic ceiling tile			
Gypsum drywall			
Carpet/ carpet pad			
Plastic pipe			
Plastic buckets			
Plastic			
Hardiplank siding and boards			
Glass			
Cardboard			
Pallets			
Job office trash, paper, glass & plastic bottles, cans, plastic			
Alkaline and rechargeable batteries, toner cartridges and electronic devices			
Others:			
Others:			
Others:			
Others:			
Others:			

CONSTRUCTION WASTE MANAGEMENT (CWM) ACKNOWLEDGE

Note: This sample form may be used to assist in documenting compliance with the waste management plan.

Project Name: _____

Job Name: _____

Project Manager: _____

Waste Hauling Company: _____

CWM Plan Acknowledgement

The Foreman for each new Subcontractor that comes on site is to receive a copy of the Construction Waste Management Plan and complete this Acknowledgement Form.

I have read the Waste Management Plan for the project; I understand the goals of this plan and agree to follow the procedures described in this plan.

[illegible]

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.
 - 1. Standard details and requirements per jurisdiction requirements, not limited to herein.

1.2 SUMMARY

- A. This Section includes, but not limited to, erosion and sedimentation controls and related items.
 - 1. Provide "Data Submitter" information to Legal Responsible Person (LRP)-(District).
 - 2. LRP creates project with "SMARTS" account. LRP will add "Data Submitter" to project.
 - 3. Data Submitter to input / upload information for Permit Registration Documents (PRD's).
 - 4. LRP to submit PRD's (SMARTS Protocol).
 - 5. State of Water Resources Control Board (SWRCB) will send notification of fees for permit, issues with PRD's and/ or Notice of Intent (NOI).
 - 6. SWRCB will evaluate fees for permit. Permit for Waste Discharge/ Identification (WDID) number will be issued by SWRCB once fees are paid. LRP to pay fees for permit to SWRCB.
 - 7. SWRCB notifies LRP of approval of Notice of Intent (NOI) (NOI can be viewed at SMARTS website).
 - 8. Installation of temporary erosion control systems per PRD's.
 - 9. Installation of temporary slope protection systems per PRD's.
 - 10. Removal of temporary measures where required by SWPPP per PRD's.
 - 11. Signage and posting per requirements per PRD's.
 - 12. Annual report(s), file with SMARTS by Data Submitter.
 - 13. Post-Construction water balance calculation by Data Submitter.
 - 14. File Notice of Termination (NOT) upon completion of project with SMARTS by Data Submitter.
 - 15. Data Submitter to notify LRP of NOT filing. LRP to submit NOT (SMARTS Protocol).
 - 16. SWRCB to notify LRP NOI submitted.
 - 17. Miscellaneous requirements per local jurisdiction.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Summary of Work" for HCP requirements and related work.
 - 2. Division 1 Section "Temporary Facilities" for additional PRD's requirements.
 - 3. Division 1 Section " Project Closeout" for additional PRD's requirements.
 - 4. Division 31 Section "Earthwork" for related items.
 - 5. Division 31 Section "Site Clearing" for related items.
 - 6. Division 33 Section "Utility Materials" for related items.

1.3 REQUIREMENTS

- A. The NOI and related fee shall be submitted electronically on the State Water Boards Stormwater Multi-Application and Report Tracking system (SMARTS) website, <http://smarts.waterboards.ca.gov> prior to the start of construction.

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1. The Owner will pay the filing fee, when prompted by SMARTS and notification of Data Submitter fees are ready to be paid.
- B. Definitions:
1. Data Submitter – prepares and inputs data for Contractor into SMARTS (paid by Contractor)
 2. LRP: Legal Responsible Person (District)
 3. PRD's: Permit Registration Document(s)
 4. SMARTS: Stormwater Multi Application and Report Tracking System
 5. NOI: Notice of Intent
 6. NOT: Notice of Termination
 7. SWRCB: State Water Resources Control Board
 8. RWQCB: Regional Water Quality Control Board
 9. WDID: Waste Discharge Identification
 10. ATS: Active Treatment System
- C. Standard PRD Requirements (All Dischargers) per SWRCB Requirements not limited to the following:
1. Notice of Intent
 2. Risk Assessment (Standard or Site-Specific)
 3. Site Map
 4. SWPPP
 5. Annual Fee (paid by LRP)
 6. Certification
- D. Additional PRD Requirements Related to Construction Type per SWRCB Requirements not limited to the following:
1. Discharger in unincorporated areas of the State (not covered under an adopted Phase I or II SUSMP requirements) and that are not a linear project shall also submit a completed:
 - a. Post-Construction Water Balance Calculator (Appendix 2, available online at SWRCB website).
 2. Dischargers who are proposing to implement ATS shall submit:
 - a. Complete ATS Plan in accordance with Attachment F at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation.
 - b. Certification proof that design done by a professional in accordance with Attachment F (available online at SWRCB website).
 3. Dischargers who are proposing an alternate Risk Justification:
 - a. Particle Size Analysis.
- E. Description of PRDs per SWRCB Requirements not limited to the following:
1. Notice of Intent (NOI)
 2. Site Map(s) Includes:
 - a. The project's surrounding area (vicinity)
 - b. Site layout
 - c. Construction site boundaries
 - d. Drainage areas
 - e. Discharge locations
 - f. Sampling locations

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- g. Areas of soil disturbance (temporary or permanent)
 - h. Active areas of soil disturbance (cut or fill)
 - i. Locations of all runoff BMPs
 - j. Locations of all erosion control BMPs
 - k. Locations of all sediment control BMPs
 - l. ATS location (if applicable)
 - m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
 - n. Locations of all post-construction BMPs
 - o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices.
3. SWPPPs
- a. A site-specific SWPPP shall be developed by each discharger and shall be submitted with the PRDs.
4. Risk Assessment - All dischargers shall use the Risk Assessment procedure as describe in the General Permit Appendix 1 (available online at SWRCB website).
- a. The Standard Risk Assessment includes utilization of the following:
 - 1) Receiving water Risk Assessment interactive map
 - 2) EPA Rainfall Erosivity Factor Calculator Website
 - 3) Sediment Risk interactive map
 - 4) Sediment sensitive water bodies list
 - b. The Site-Specific Risk Assessment includes the completion of the hand calculated R value Risk Calculator
5. Post-Construction Water Balance Calculator - All dischargers subject to this requirement shall complete the Water Balance Calculator (in Appendix 2) in accordance with the instructions.
6. ATS Design Document and Certification - All dischargers using ATS must submit electronically their system design (as well as any supporting documentation) and proof that the system was designed by a qualified ATS design professional (see Attachment F – available online at SWRCB website).
- F. Information For additional information contact:
- Regional Water Quality Control Board
Fresno Branch Office
1685 East Street
Fresno, CA 93706
(559) 445-5116
- Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(530)542-5400
1. If this project transverses more than one Regional Water Quality Control Board (RWQCB) jurisdiction, a complete Notice of Intent package (Notice of Intent, site map, and fee) and Notice of Termination (upon completion of each section), must be filed for each RWQCB.

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- G. Annual report required for projects under construction for more than one continuous 3 month period, no later than September 1, of each year. This shall be done on line via the SMARTS web site, see above, for the period July 1, to June 30. Provide information needed for overall program evaluation and public information.
1. Summary and evaluation of all sampling and analysis results
 2. Laboratory reports referenced specifically to SWPPP
 3. Summary of all corrective actions taken during the compliance year and identification of any compliance activities.

1.4 EROSION CONTROL AND SLOPE PROTECTION IMPLEMENTATION

- A. Prevention Plan to be dictated by site conditions in order to maintain the intent of the specifications and permits at no additional cost to Owner.
- B. Owner has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations and to direct Contractor to provide immediate permanent or temporary pollution control measures.
- C. Maintain temporary erosion control systems as directed by Owner or governing authorities to control siltation during life of contract. Contractor shall respond to maintenance or additional work ordered by Owner or governing authorities within 48 hours or sooner if required at no additional cost to the Owner.
- D. Slopes that erode easily or that will not be graded for a period of 14 days or more shall be temporarily seeded as work progresses with wheat, rye or oats application in accordance with City Standards unless otherwise specified on the Construction Drawings.

1.5 POSTING ON SITE

- A. Post and maintain all notices per SWPPP requirements and requirements herein not limited to the following:
1. Construction trailer, post the following on a specific allocated board viewable by all parties to this project:
 - a. NOI
 - b. Permit
 - c. Inspection report clipboard
 - d. Site stabilization and Construction activity Dates log
 - e. Rainfall log
 2. Site
 - a. Notice of permit and application
 - b. Site map
 - c. Contractor contact information.
 - d. Sign that indicates the following, size 48" x 48":

SWPPP
Strictly Enforced
You Must

- Comply with all Government Agency Requirements
 - Use provided washout areas
 - Keep mud off streets

Failure to comply will result in a minimum \$1000 Fine.

END OF SECTION 018100

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section requires the selective removal and subsequent offsite disposal, unless noted otherwise, but not limited to, the following:
 - 1. Demolition and removal of selected site elements.
 - 2. Sawcutting as required for removal of items indicated on plans and herein.
 - 3. Sawcutting and removal of sidewalks, curbs and related items.
 - 4. Sawcutting and removal of AC paving. Base and subbase and related items.
 - 5. Portions of existing Site Work indicated on Drawings and required to accommodate new construction.
 - 6. Remove and disposal of asphalt paving per County requirements. Contact County Health Department for disposal procedures as required.
 - 7. Remove existing chain link fencing and related items indicated on plans.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Construction Waste Reduction, Disposal and Recycling" for waste and disposal requirements.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

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- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Schedule indicating proposed sequence of operations for selective demolition work to Architect for review prior to start of work with starting and ending dates for each activity. Include coordination dates for shutoff, capping, and continuation of utility services as required for review and approval by Architect and Owner.
 - 1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
 - 2. Coordinate with Owner's continuing occupation of portions of existing facilities and with Owner's partial occupancy of completed work. Provide dates of partial occupancy availability of portions of work for owner's use.
 - 3. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property , for environmental protection , for dust control and, for noise control. Indicate proposed locations and construction of barriers.
 - 4. Note and secure prior approval by Owner and Architect in writing of any items that will impact the Owner's continuing operations and note dates of impact. If no impacts provide statement in submittal to that owner's continuing operations will not be impacted by project activities.
- C. Digital photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. Provide copies in submittal; provide seven copies on computer discs prior to start of work.

1.6 CLOSEOUT SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes

1.7 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. Title 24, Part 1 CCR 2019, Chapter 5 (California Green Building Standard Code)

1.8 JOB CONDITIONS

- A. Occupancy: Owner will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition

activities that will affect Owner's normal operations.

1. Refer to Section "Summary of Work" for limitations on noise generations, access and other restrictions.
- B. Condition of Facilities: Owner assumes no responsibility for actual condition of items or facilities to be demolished.
 1. Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations may occur by Owner's removal and salvage operations prior to start of selective demolition work.
 2. Owner has first right of refusal of salvaged items. Contractor shall dispose of all items Owner does not want. Owner will walk through project prior to start of demolition and mark items for salvage. Contractor to schedule walk within 7 days written advance notification of architect, owner, subcontractors and consulting engineers.
- C. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed as work progresses. Transport salvaged items from site as they are removed. Document all items on Construction Waste Management Plan and reports.
 1. Storage or sale of removed items on site will not be permitted.
- D. Protections: Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective demolition work.
 1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of building.
 2. Erect temporary covered passageways as required by authorities having jurisdiction.
 3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.
 4. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
 5. Remove protections at completion of work.
 6. Equipment, materials and supplies temporarily removed for protection shall be replaced in original locations. Any materials damaged shall be replaced with new materials of like kind and quality.
 7. Protect wall, trim, floors, equipment, utility lines and materials. When working on finished surfaces limit damage to the smaller area if possible and restore to the pre-construction condition all surfaces which are damaged because of the installation of this work.
- E. Damages: Promptly repair damages caused to adjacent facilities by demolition work.
- F. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
 1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- G. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

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- H. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
 - 1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
 - 2. Maintain fire protection services during selective demolition operations.
- I. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
 - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
- J. Fire safety during demolition.
 - 1. Combustible Debris: Combustible debris shall not be accumulated within buildings and site. Combustible debris, rubbish and waste material shall be removed from buildings as often as practical. Combustible debris, waste material and trash shall not be burned on site.
 - 2. Motor Equipment: Internal-combustion-powered construction equipment shall be used in accordance with the following:
 - a. Equipment shall be located so that exhausts do not discharge against combustible material.
 - b. When possible, exhausts shall be piped to the outside of the building.
 - c. Equipment shall not be refueled while in operation.
 - d. Fuel for equipment shall be stored in an approved area outside of the building and provided for containment for any spills of containers over 5 gallons.
 - 3. Cutting and Welding: Cutting and welding operations shall be in accordance with Chapter 26 - California Fire Code.
 - 4. Flame-producing Equipment: The use of torches or flame-producing devices for the sweating of pipe joints shall be in accordance with Chapter 14 and Chapter 26 - California Fire Code.
 - 5. Flammable Liquids: The storage, use and handling of flammable liquids shall be in accordance with Chapter 34 - California Fire Code. Ventilation shall be provided for operations utilizing the application of materials containing flammable solvents.
 - 6. Open-flame Devices: Open-flame devices and other sources of ignition shall not be located in areas where flammable materials are being used.
 - 7. Building Access: Access to buildings for the purpose of fire fighting shall be provided per CFC 501.4 and 1412.1 and CBC 3311.4. Construction material shall not block access to buildings, hydrants or fire appliances; maintain areas around device clear at all times.
 - 8. General: Demolition of buildings shall be in accordance with Chapter 14 - California Fire Code.
 - 9. General: Construction of building shall be in accordance with Chapter 14 and Chapter 26 – California Fire Code.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- C. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- D. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- E. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- F. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.2 PREPARATION

- A. General: Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.
 - 1. Cease operations and notify Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
 - 2. Cover and protect furniture, equipment, and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed.
 - 3. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupy and non-construction portions of the building.
 - a. Where selective demolition occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4-inch studs, 5/8-inch drywall (joints taped) on occupied side, 1/2-inch plywood on demolition side. Fill partition cavity with 4" sound-deadening insulation.
 - b. Provide weatherproof closures for exterior openings resulting from demolition work.
 - 4. Locate, identify, cap off, and disconnect utility services that are not indicated to remain.
 - a. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during changeover. Schedule change over during building/site non-occupied times, and after hours.

3.3 DEMOLITION

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
 - 1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use

- power-driven impact tools.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 5. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
 6. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.
 9. Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel, or sand, free of trash and debris, no stones over 1 inch in diameter, roots, or other organic matter.
- B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.
- C. Demolition work that generates noise shall be scheduled around schedule of occupied rooms within 125 feet of work to be done. This work may have to be done during after hours, evenings and weekends, depending on occupancy schedules. Verify with Director of Facilities prior to scheduling any noise-generating demolition. See Section 011000 for additional requirements. Obtain approvals in writing from Director of Facilities for any work during occupied hours within 125 feet of occupied spaces

3.4 SALVAGED MATERIALS

- A. Salvaged Items: Where indicated on Drawings as "Salvage - Deliver to Owner," carefully remove indicated items, clean, store, and turn over to Owner and obtain receipt.
1. Owner shall remove all items prior to start of demolition of each area of building that they want to salvage. Owner shall have first right of salvage. All items left after Owner has completed salvage shall become property of Contractor.
- B. Where noted herein, Contractor shall remove, package and deliver salvage items to Owner.
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.

3.5 DISPOSAL OF WASTE/ DEMOLISHED MATERIALS

- A. Remove site debris, rubbish, and other materials resulting from demolition operations. Transport and legally disposed off site per Construction Waste Management Plan.

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1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
2. Burning of removed materials is not permitted on project site.

3.6 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections.
 1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.
 2. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes, but is not limited to, the following:
 - 1. This Section specifies cast-in place concrete, rebar dowels, including formwork, reinforcing, mix design, placement procedures, finishes and curing.
 - 2. Foundations and footings.
 - 3. Slabs-on-grade.
 - 4. Foundation walls and retaining walls.
 - 5. Concrete footings/bases for miscellaneous items on site.
 - 6. Concrete fence and gate post footings.
 - 7. Placement of anchor bolts.
 - 8. Concrete sealer all exposed building slabs on and above grade.
- B. Related Sections: The following sections contain requirements that related to this Section.
 - 1. Concrete paving and walks are specified in Division 32, Section "Portland Cement Concrete Paving".

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by the Architect. Mill certification for reinforcing steel and chemical analysis for each heat delivered to the site. Cement manufacturer's certification of manufacture and testing.
- C. Shop drawings for reinforcement, for fabrication, bending, and placement of concrete reinforcement. Comply with ACI SP-66 (2004), "ACI Detailing Manual," showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- D. Samples of materials as requested by Architect, including names, sources, and descriptions, as follows:
 - 1. Normal weight aggregates.
 - 2. Reglets.
 - 3. Vapor retarder.
- E. Independent laboratory test reports for concrete materials and mix design test.

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- F. Concrete mix design from an approved laboratory signed by a Civil or Structural Engineer licensed in the State of California. Mix designs shall indicate compliance with applicable sections of Chapter 19A of the 2019 CBC.
- G. The cost of testing all materials, including aggregate grading in conjunction with mix designs shall be paid by the Owner. The Contractor shall cooperate in furnishing test materials so that tests may be completed prior to their installation.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. ACI 318, "Building Code Requirements for Reinforced Concrete."
 - 2. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
 - 3. Title 24, Part 2 CCR 2019, Chapter 19A.
- B. Refer to Division 1 Section "Quality Control Service", Section 014000 for quality control requirements.
- C. No work of this Section shall be covered until inspected by the Structural Engineer or Project Inspector.
 - 1. Structural Engineer or Project Inspector shall be notified a minimum of 3 days prior to placing structural concrete and be given opportunity to review rebar and form placement.
 - 2. Project Inspector shall be present during concrete pour and the application of concrete curing processes.

1.5 WARRANTY FOR CONCRETE SEALER/HARDNER/CURING COMPOUND.

- A. Manufacturer of the concrete sealer/hardener/curing compound shall warrant the floor covering system against failure due to moisture vapor migration or moisture-born contaminants for a period of (15) years from the date of original installation. The warranty shall cover all labor and materials needed to replace all floor covering that fails due to moisture vapor emission & moisture born contaminants.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
 - 1. Use overlaid plywood complying with U.S. Product Standard PS-1 "A-C or B-B High Density Overlaid Concrete Form," Class I.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Forms for Cylindrical Columns and Supports: Metal, fiberglass-reinforced plastic, or paper or

fiber tubes. Provide paper or fiber tubes of laminated plies with water-resistant adhesive and wax-impregnated exterior for weather and moisture protection. Provide units with sufficient wall thickness to resist wet concrete loads without deformation.

- D. Form Coatings: Provide commercial formulation form-coating compounds with a maximum VOC of 350 mg/l that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- E. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to exposed surface.
 - 1. Provide ties that, when removed, will leave holes not larger than 1-inch diameter in concrete surface.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: Shall be deformed bars conforming to ASTM A615, Grade 60 unless noted otherwise; #4 and smaller bars may be grade 40. Reinforcing bars intended for welding shall conform to ASTM A706 (Grade 60). Reinforcing steel that is required to be re-bent shall be ASTM A615, Grade 40.
- B. Smooth dowels shall be ASTM A 36, steel.
- C. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- D. Welded Wire Fabric: ASTM A 185, plain welded steel wire fabric.
- E. Welded Deformed Steel Wire Fabric: ASTM A 497.
- F. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications in above grade applications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For concrete cast against earth, reinforcing steel shall be supported by appropriately sized precast concrete blocks with integral wire ties.
- G. Epoxy-Coated Reinforced Bars: ASTM A 615/ A 615M, Grade 60 deformed bars. Epoxy coated with less than 2 percent damaged coating in each 23-inch (300mm) bar length.

2.3 CONCRETE MATERIALS

- A. Portland Cement: Type V or Type II/V, ASTM C 150, and CBC Sec. 1903A.1.
 - 1. The cement shall not contain more than 0.60% total alkali when calculated as Sodium Oxide.
 - 2. Cement shall be stored in such a manner as to protect it from inclusion of foreign material and damage by moisture. Only one (1) brand of cement shall be used for this work.
- B. Fly Ash: Shall conform to ASTM C618, Type "F" and CBC 1903A.4 except that loss on ignition shall not exceed 4%.

- C. Normal Weight Aggregates: Aggregate shall conform to ASTM C33, CBC Sec. 1903A.1, Table I below and following. Provide non-reactive aggregate from a single source for all concrete used in this project. Reactivity testing of aggregate (coarse and/or fine) will be required if, in the opinion of the Structural Engineer and/or DSA, the source is questionable. The basis for acceptance of aggregate shall be that all samples of fine and coarse aggregate shall be determined "innocuous" by testing in accordance with ASTM C289.
1. Do not use fine or coarse aggregates containing spalling-causing deleterious substances. Aggregate that is known or determined to be reactive in the presence of cement alkalies shall not be incorporated in the work.
 2. Fine aggregate shall consist of a washed natural sand of hard, strong and durable particle and which does not contain more than two percent (2%) by weight of deleterious substances such as clay lumps, shale, schist, alkali, mica, coated grains, or soft and flaky particles. Fine aggregate shall be graded uniformly from fine to coarse and when combined with coarse aggregate shall meet the requirements of Table 1 below.
 3. Coarse aggregate shall consist of a clean, hard, fine grained, sound crushed rock, or washed gravel. It shall contain not more than five percent (5%) by weight of flat, thin, elongated, or laminated material nor more than two percent (2%) by weight shale or cherty material. Coarse aggregate shall be graded uniformly from one fourth inch (1/4") in size to maximum size and when combined with fine aggregate shall meet the requirements of Table 1 below.

TABLE I
GRADING OF COMBINED AGGREGATES

Sieve Woven Wire Cloth	Percent by Wt. 1-1/2" Max	Percent by Wt. 1" Maximum	Percent by Wt. 3/4" Maximum
Passing a 1-1/2"	95-100		
Passing a 1"	70-90	90-100	
Passing a 3/4"	50-80	70-95	90-100
Passing a 3/8"	40-60	45-70	55-75
Passing a #4	35-55	35-55	40-60
Passing a #8	25-40	27-45	30-46
Passing a #16	16-34	20-38	23-40
Passing a #30	12-25	12-27	13-28
Passing a #50	2-12	5-15	5-15
Passing a #100	0-3	0-5	0-5

D. Aggregate Size:

Type of Work	Max. Aggregate Size
Joists or wall less than 5" wide.....	3/4"
Beams or walls 5" to less than 8" wide, slabs above grade less than 6" thick, floor slabs on grade.....	1"
All other concrete.....	1"

- E. Water: Shall be clean and free from deleterious acids, alkali, oil and organic matter and shall be potable.
- F. Water-Reducing Admixture: ASTM C 494, Type A. Admixtures, other than those pre-approved (below) shall be the types with prior DSA approval.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include but are not limited to the follow:

- a. Grace WRDA-64.
- b. Pozzoloth 322-N

2.4 RELATED MATERIALS

- A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- B. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
 - 1. Waterproof paper.
 - 2. Polyethylene film.
 - 3. Polyethylene-coated burlap.
- C. Concrete sealer/hardener/curing compound
 - 1. Sealer/Hardener/Curing Compound: Concrete surface treatment applied the day of the concrete pour in lieu of other curing methods for concrete slabs either on grade, below grade or above grade receiving resilient flooring such as sheet vinyl, vinyl composition tile, rubber, wood flooring, carpet, epoxy coating and overlays.
 - 2. ASTM C1315 Type 1 Class A, ASTM C309 Type 1 Class A, penetrating product to have no less than 34% solid content, leaving no sheen, volatile organic compound (VOC) content rating as required to suit regulatory requirements. Product to have at least a 5-year documented history in controlling moisture vapor emission from damaging floor covering, compatible with all floor finish materials.
 - 3. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, product specified.
 - a. "PMC3300", Curranseal
- D. Exposed Concrete Sealer: Water based acrylic concrete sealer, no VOC's composed of methyl metacrylate copolymer resins and aromatic resins.

Properties

Color	Water clear
Solids	25-27% by weight
Flash point	0
Viscosity	22 Sec
Dry Time	Normal Traffic 4-8 hours
	Max hardness 7 days
Coverage	200sf/gallon

- 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Exposite "WB", Lambert Corporation 1-800-432-4746.
- E. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

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- a. "Aquafilm," Conspec Marketing and Mfg. Co.
- b. "Eucobar," Euclid Chemical Co.
- c. "E-Con," L&M Construction Chemicals, Inc.
- d. "Confilm," Master Builders, Inc.

F. Bonding Compound: Polyvinyl acetate or acrylic base.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Polyvinyl Acetate (Interior Only):
 - 1) "Superior Concrete Bonder," Dayton Superior Corp.
 - 2) "Euco Weld," Euclid Chemical Co.
 - 3) "Weld-Crete," Larsen Products Corp.
 - 4) "Everweld," L&M Construction Chemicals, Inc.
 - 5) "Intra-Lok," W. R. Meadows, Inc.
 - b. Acrylic or Styrene Butadiene:
 - 1) "Acrylic Bondcrete," The Burke Co.
 - 2) "Strongbond," Conspec Marketing and Mfg. Co.
 - 3) "Day-Chem Ad Bond," Dayton Superior Corp.
 - 4) "SBR Latex," Euclid Chemical Co.
 - 5) "Daraweld C," W.R. Grace & Co.
 - 6) "Hornweld," A.C. Horn, Inc.
 - 7) "Everbond," L & M Construction Chemicals, Inc.
 - 8) "Acryl-Set," Master Builders Inc.
 - 9) "Sonocrete," Sonneborn-Rexnord.
 - 10) "Stonlock LB2," Stonhard, Inc.

G. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material "Type," "Grade," and "Class" to suit project requirements.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. "Burke Epoxy M.V.," The Burke Co.
 - b. "Spec-Bond 100," Conspec Marketing and Mfg. Co.
 - c. "Euco Epoxy System #452 or #620," Euclid Chemical Co.
 - d. "Epoxite Binder 2390," A.C. Horn, Inc.
 - e. "Epabond," L&M Construction Chemicals, Inc.
 - f. "Concresive 1001," Master Builders, Inc.
 - g. "Sikadur 32 Hi-Mod," Sika Corp.
 - h. "Rezi-Weld 1000," or "Gel Paste," W. R. Meadows, Inc.

2.5 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301 and CBC 1905A.2. If trial batch method used, use an independent testing facility acceptable to the Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

1. Concrete design mix(es) shall be prepared, signed and stamped by an independent California registered civil engineer.
 2. Mix design shall indicate compliance with applicable section of CBC 2019 Chapter 19A.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by the Architect, Structural Engineer and approved by lab of record.
- C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:
1. 00-psi, 28-day compressive strength; water/cement ratio, 0.42 maximum (non-air-entrained), shall be at least 2400-psi at 7-day. Minimum cement content 6.2 sacks per cubic yard.
- D. Proportions: The Contractor shall propose to the Architect and Structural Engineer Laboratory Designed Mixes based on the following limitations: The mix design shall be approved prior to use. The relative amounts of cement, fine and coarse aggregate and mixing water shall be determined by a testing laboratory in accordance with CBC 1905A.3 or 1905A.4. The concrete ready-mix supplier shall pay the costs of concrete mix designs, excluding the cost of aggregate gradation analysis where required.
- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect and Structural Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Architect, Structural Engineer, and Laboratory before using in work.
- F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. The amount of mixing water used (including free moisture carried by the aggregate) shall not exceed the maximum allowed by the approved mix design. The addition, the amount used shall be the minimum necessary to produce the following maximum allowable slumps:

 Slabs.....4"
 Other.....4"

The slump test shall conform to ASTM C-143.

2.6 CONCRETE MIXING

- A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as specified. Use a single source for all concrete incorporated in the project.
1. Transit Mixed Concrete shall be mixed and delivered in accordance with the requirements of ASTM C-94 and CBC 1905A. Transit mixed concrete shall not be delivered to the work with the total specified amount of water incorporated therein. Two and one-half (2-1/2) gallons of water per cubic yard shall be withheld but may be incorporated in the mix under the supervision of the representative of the Architect. Transit mixed concrete shall be mixed for a period of not less than ten (10) minutes at a peripheral drum speed of approximately two hundred (200) feet per minute and mixing shall be continued until discharge is complete. Concrete will be rejected if not discharged within one and one-half

(1-1/2) hours during normal weather or forty-five (45) minutes during hot weather after the addition of cement to the aggregates. The manufacturer of the transit mixed concrete shall furnish with each mixer truck a certificate stating the quantity of cement, water, fine aggregate, coarse aggregate and admixture (if used) in each batch delivered to the job.

- B. Batch plant inspection is required in accordance with CBC 1704A.4.2.
- C. Concrete shall be sampled, tested and inspected in compliance with 2019 CBC 1905A.6 and 1916A and 1704A.4.

PART 3 - EXECUTION

3.1 GENERAL

- A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

3.2 FORMS

- A. General: Design, erect, support, brace, and maintain formwork to support vertical and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.
- B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste. The arrangement and construction shall be subject to the approval of the Engineer, but responsibility for adequacy of the forms shall rest with the Contractor. The supporting studs or joists shall be spaced not more than twelve inches (12"-0) center to center. The surfaces of the forms shall be smooth and free from irregularities. Wall form panels shall be placed with their long dimension horizontal and so as to form continuous horizontal joints.
- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal. The forms shall not be removed until the concrete has sufficiently hardened to permit their removal with safety, but in no case in less time than as follows:

Columns, walls, vertical forms.....24 hours
Slab (above grade).....7 days
Joists, Beams and Girders.....14 days

All removal shall be accomplished in such a manner as to prevent injury to the concrete and comply with CBC 1906A.2.

- D. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary

openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

- E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retighten forms and bracing before concrete placement as required to prevent mortar leaks and maintain proper alignment.

3.3 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.
- D. Place reinforcement:
 - 1. Reinforcing shall be accurately placed in accordance with the drawings and meeting CRSI and shall be securely tied in position with at least No. 16 gage annealed wire at all bar intersections except that in floor slabs on grade bars shall be tied at alternate intersections. Metal chairs and bolsters shall be used to hold all steel above the form bottoms at the proper distance. Metal spacers shall be used to secure the proper spacing of the steel. Precast concrete blocks shall be used to support reinforcing steel off the ground in footings and slabs at 36" o.c. max. The clear distance between parallel bars shall not be less than 1-1/2 times the bar diameter, but in no case less than 1-1/2" nor less than 1-1/3 times the maximum size of coarse aggregate.
 - 2. Splices shall be made with a lap of at least Class "B" unless noted otherwise. Do not locate splices at control joints. The bars shall be placed in contact and wired together in such a manner as to maintain a clearance of not less than the minimum clear distance to the other bars and to the surface of the concrete. In general, stagger splices at least 4'-0". Vertical reinforcing steel shall be spliced only where specifically detailed. Splice wire mesh with a lap of at least the dimension of one mesh +2". Welded splices shall be in accordance with CBC 1908A.1.6.
 - 3. The bending and placing of all reinforcement shall conform to the "Manual of Standard Practice" of the American Concrete Institute and CRSI. Bends shall be made as indicated on the drawings. Bars shall be bent cold.
- E. No unprotected aluminum embedments.
 - 1. Coat all aluminum embedments with bituminous coating or approved equal.

3.4 JOINTS

- A. Construction Joints: Shall be cleaned and roughened per CBC 1906A.4. Locate and install construction joints (expansion joints) as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect and Structural Engineer.
1. All vertical members, such as walls and columns, shall be poured at least two (2) hours before horizontal members are poured therein to permit the concrete in the vertical members to take its initial settlement.
 2. After the pour has been completed to the construction joint and the concrete has hardened, the entire surface of the joint shall be thoroughly cleaned of surface laitance and clean coarse aggregate exposed by means of wire brushing and washing with a pressure stream of water. This shall be done at least two (2) hours, but not more than four (4) hours after the concrete was placed.
 3. A modified mix of concrete as hereinbefore specified with fifty percent (50%) of the coarse aggregate omitted may be deposited on horizontal construction joints before proceeding with the regular specified mix.

This same modified mix may be used where conditions make puddling difficult or where reinforcing is congested.
 4. The location of construction joints shall be as shown on the plan or as approved by the Architect. Vertical construction joints shall be keyed.
 5. Maximum spacing shall be 20 feet on center.
- B. Provide keyways at least 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Accepted bulkheads designed for this purpose may be used for slabs.
- C. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

3.5 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.
- B. The Contractor shall cooperate with all tradesmen to insure that all conduit, anchor bolts, sleeves, inserts, hangers, etc., are properly installed and secured in correct position. All embedded items shall be thoroughly clean and free from rust, scale, oil or other foreign matter. All embedded items, including bolts, shall be securely held in their final positions by means of wood templates before any concrete is poured.
- C. Pipes, other than electrical conduit, shall not be embedded in structural concrete. Where conduit is specifically shown on the structural drawings to run in slabs on grade, conduit shall be located within the middle half of the slab and its outside diameter shall not be greater than three-quarter (3/4) inch diameter. Architect shall approve all locations. Electrical conduits shall run a minimum of 6" below bottom of slab.
- D. The Contractor shall properly form all reglets and rebates required in the concrete to receive flashings, frames and other equipment. Dimensions and details shall be obtained from the equipment to be provided for.

- E. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.
- F. No unprotected aluminum embedments.
 - 1. Coat all aluminum embedments with bituminous coating or approved equal.

3.6 PREPARATION OF FORM SURFACES

- A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before reinforcement is placed.
- B. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- C. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

3.7 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Concrete shall not be placed until forms and rebar have been inspected by the Project Inspector. Project Inspector will confirm moisture content level of base material prior to placement of concrete, see requirement herein.
- B. General: Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
- C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete to avoid segregation at its final location.
- D. Concrete shall be used while fresh and before it has taken an initial set. Retempering partially hardened concrete with additional water will not be permitted. Concrete shall be placed in horizontal layers of such thickness that can be satisfactorily consolidated with vibrators. The concrete shall be placed as nearly as possible in its final position and the use of vibrators for extensive shifting of fresh concrete shall not be permitted. Fresh concrete shall not be permitted to fall more than six feet (6'-0") without the use of adjustable length pipes or "elephant trunks". The use of chutes in conveying concrete will not be permitted except with the Architect's approval and only if segregation does not occur and concrete of proper consistency flows freely. Once concreting is started, it shall be carried on as a continuous operation at such a rate that the concreting surface is at all times plastic and flows readily until the section is completed between pre-determined construction joints.
- E. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by

- hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- F. Cold-Weather Placing: Comply with provisions of ACI 306, CBC 1905.12 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- G. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
1. The concrete shall then be protected from freezing or frost for a period of five (5) days after placing by a means acceptable to the Architect and the Division of the State Architect for projects under their jurisdiction. Chloride shall not be added to the mix.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- H. Hot-Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305, CBC 1905.13 and as herein specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
 2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
 3. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
 4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, when acceptable to Architect.
 5. Concrete (excepting foundations) shall not be placed when the maximum air temperature expected to exceed 100 degrees F. on the day of placement unless specifically approved by the Architect. Such approval may require any or all of the following precautions:
 - i. Provide shade for slabs to be finished after 11:00 a.m.
 - j. Store all materials and equipment in the shade.
- I. Moisture content of base material under concrete shall be as prescribed herein and confirmed by project inspector immediately prior to casting concrete. Base material shall be removed and replaced with dampened sand meeting this limitation if the upper limit is exceeded prior to casting.

3.8 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed to view in the finish work or

concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

- B. Smooth Form Finish: For formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 CONCRETE CURING AND PROTECTION

- A. General: Concrete shall be maintained above 50°F and in a moist condition for at least the first seven (7) days after placement in accordance with CBC Sec. 1905.12 and ACI 308. During hot weather, proper attention shall be given to ingredients, production methods, handling, placing, protection and curing to prevent excessive concrete temperatures or water evaporation that may impair required strength or serviceability. Provide curing methods that will eliminate alternate cycles of wetting and drying.
 - 1. Formed Surfaces: Formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces shall be moist cured, as described below, for the full curing period. If forms are removed prior to the conclusion of the curing period, moist curing of the surfaces shall be continued until the end of the prescribed curing period.
 - 2. Construction Joints: Construction joints shall be prepared as herein specified and receive moist curing, as described below, for the curing period. Liquid membrane forming compound shall not be used for the curing of construction joints.
 - 3. Unformed Surfaces: Slabs, floor toppings and other unformed surfaces shall be cured by the application of liquid membrane forming compound unless otherwise indicated below.
 - a. Moist curing shall be used in areas to receive toppings, ceramic tile, terrazzo, surfaces to receive liquid floor hardener or other materials that are incomparable with liquid membrane forming compound.
 - a. Slab surfaces to remain exposed shall be cured using water-based acrylic membrane forming curing compound.
 - b. Slab surfaces to receive resilient flooring such as sheet vinyl composition tile, rubber, wood flooring, carpet, epoxy coating and overlay shall be cured using concrete sealer/hardener/curing compound.
- B. Initial curing, such as fog spraying in accordance with ACI 308.1, may be employed; other initial curing methods shall be approved by the Architect prior to the commencement of the work. Start final curing as soon as free water has disappeared from concrete surface after placing and finishing.
- C. Final curing methods as noted below specific to concrete final finish materials and coatings:
 - 1. Moisture curing by one or more of the following methods: (All areas not noted herein otherwise).

- a. Ponding: Maintain a minimum of 1 inch of water over the entire area.
 - b. Spray: Maintain a wet surface over the entire area by fog spraying or by sprinkling, using caution to avoid erosion of the surface.
 - c. Absorptive cover: Cover surface with absorptive mats covering the entire surface and edges (with a 4 inch lap with adjacent mats); thoroughly saturate mats with water and keep continuously wet.
 - d. Forms shall be covered and kept continuously moist during the full curing period.
2. Moisture-cover curing by covering the pre-wetted concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape. The cover shall be in contact with the concrete surface at all times during the curing period. (All areas not noted herein otherwise).
3. Membrane-forming curing (or curing/sealing) compound: (All areas not noted herein otherwise).
 - a. Apply curing compound to concrete surfaces as soon as final finishing pass is completed and within 1 hour after surface water sheen has disappeared. Apply uniformly in a continuous operation by power spray or roller in accordance with the manufacturer's published directions and at the rate of application recommended by the manufacturer (for curing) and conforming to ASTM C1315.
 - b. Recoat areas subjected to rainfall, again within 2 hours after surface water sheen has disappeared. Maintain continuity of coating and repair damage during the curing period.
3. Concrete sealer/hardener/curing compound with warranty: (Occurs at all areas with VCT, Rubber flooring, Sheet Vinyl, SDVCT, wood flooring and similar floor finishes).
 - a. Apply concrete sealer/hardener/curing compound on the day of the concrete pour prior to any other chemical treatments for concrete slabs either on grade, below grade or above grade receiving resilient flooring such as sheet vinyl, vinyl composition tile, rubber, wood flooring, carpet, epoxy coatings and overlays.
 - b. Manufacturer's technician shall be on site the day of the concrete pour to install or train in application document and shall return on every application thereafter to verify that proper procedures are followed in accordance with the manufacturer's published direction and at the rate recommended by the manufacturer and conforming to ASTM C1315.
 - c. Moisture content of base material under concrete shall be between 5% and 7% immediately prior to casting concrete. Base material shall be removed and replaced with dampened sand meeting this limitation if the upper limit is exceeded prior to casting. Project Inspector shall confirm this requirement is met prior to allowing concrete to be placed.

3.10 SHORES AND SUPPORTS

- A. General: Comply with ACI 347 for shoring and reshoring in multistory construction, and as herein specified.

3.11 REMOVAL OF FORMS

- A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns,

and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

3.12 REUSE OF FORMS

- A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces except as acceptable to Architect.

3.13 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

3.14 GROUT AND DRYPACK (Other than non-shrink)

- A. Grout shall be composed of one (1) volume of portland cement and three (3) volumes of fine aggregate and only enough water to make the mixture flow under its own weight.
- B. Drypack shall be composed as for grout except that only enough water shall be added to set the mixture (no free water and no slump). Drypack will be tamped into place.
- C. Do not use grout or drypack that has been mixed longer than thirty (30) minutes.
- D. Grout and drypack shall be kept moist for a minimum of 7 days.

3.15 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.
 - 1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with

- water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar before bonding compound has dried.
2. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry-pack mortar, or precast cement cone plugs secured in place with bonding agent.
1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope.
1. Repair finished unformed surfaces that contain defects that affect durability of concrete. Surface defects, as such, include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop outs, honeycomb, rock pockets, and other objectionable conditions.
 2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
 3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.
 4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- D. Perform structural repairs with prior approval of Architect and Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.
- E. Repair methods not specified above may be used, subject to acceptance of the Architect.

END OF SECTION 033000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but is not limited to the following:
 - 1. Unit masonry used as one of two tiers of reinforced grouted unit masonry walls.
 - a. Mechanical yard walls.
 - b. Trash area enclosure.
 - c. Monument sign.
 - d. Raised planters.
 - e. Benches.
 - f. Tubesteel fence columns.
 - g. Retaining walls.
 - h. Planters.
 - i. Trash area.
 - j. Building walls.
 - 2. Clay unit masonry used as reinforced grouted unit masonry wall.
 - 3. Clay unit masonry in the form of brick used as one (or both) of two tiers of reinforced grouted unit masonry walls.
 - 4. Sandblasting existing brick to remove cement and obtain uniform texture. Point up after sandblasting.
 - 5. Clay unit masonry benders.
 - 6. Water repelling coating.
 - 7. Unit masonry:
 - a. Retaining walls.
 - b. Stair walls.
 - c. Mechanical yard walls.
 - d. Anchored veneer.
 - e. Building walls.
 - f. Trash enclosure.

1.3 RELATED SECTIONS

- A. The following sections contain requirements that relate to this Section:
 - 1. Division 4 Section "Cast Stone" for wall caps.
 - 2. Division 4 Section "Adhered Brick Veneer" for adhered finish.
 - 3. Division 4 Section "Anchored Masonry Veneer" for anchored veneer masonry.
 - 4. Division 5 Section "Metal Fabrication" for embedded and attached metal items.
 - 5. Division 7 Section "Flashing and Sheet Metal" for exposed sheet metal flashing installed in masonry.
 - 6. Division 7 Section "Exterior Insulation and Finish System" for adhered finish.
 - 7. Division 9 Section "Tile" for adhered stone veneer.

- B. Products installed but not furnished under this Section include the following:
1. Steel elements in unit masonry are specified in Division 5 Section "Metal Fabrications."
 2. Wood nailers and blocking built into unit masonry are specified in Division 6 Section "Rough Carpentry."
 3. Hollow metal frames in unit masonry openings are specified in Division 8 Section "Standard Steel Doors and Frames."

1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following installed compressive strengths (f'm):

1. For clay unit masonry: As follows:

f'm = 2,000 psi

2. For concrete block masonry: As follows:

f'm = 1,500 psi

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

1. Product data for each different masonry unit, accessory, and other manufactured product indicated.
2. Samples for initial selection purposes of the following:
 - a. Unit masonry samples in small-scale form showing full extent of colors and textures available for each different exposed masonry unit required.
 - b. Colored masonry mortar samples showing full extent of colors available.
3. Samples for verification purposes of the following:
 - a. Full-size units for each different exposed masonry unit required showing full range of exposed color, texture, and dimensions to be expected in completed construction.
 - b. Include size variation data verifying that actual range of sizes for brick falls within ASTM C 216 dimension tolerances for brick where modular dimensioning is indicated.
 - c. Colored masonry mortar samples for each color required showing the full range of colors expected in the finished construction. Label samples to indicate type and amount of colorant used.
 - d. Accessories embedded in the masonry.
4. Material certificates for the following signed by manufacturer and Contractor certifying that each material complies with requirements.
 - a. Each type and size of anchors, ties, and metal accessories.
5. Material test reports from a qualified independent testing laboratory employed and paid by Contractor indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:
 - a. Grout mixes. Mix design shall indicate conformance with applicable sections of

the 2013 CBC Chapter 21A and shall be signed by a California registered Structural or Civil Engineer.

6. Cold weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.
7. Hot weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.
8. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.
9. Results from tests and inspections performed by Owner's representatives will be reported promptly and in writing to Architect and Contractor.

1.6 QUALITY ASSURANCE

A. Provide materials and inspections that comply with the following 2013 CBC requirements:

1. Materials:

- | | |
|--------------------------------|-------------------|
| a. Masonry Units | 2103A.1 |
| b. Portland Cement, Lime | 2103A |
| c. Mortar and Grout Aggregates | 2103A.8, 2103A.12 |
| d. Reinforcing Bars | 2103A.13.1 |

2. Quality:

- | | |
|---------------------------|-------------|
| a. Portland Cement Tests | 1916A.1 |
| b. Mortar and Grout Tests | 2105A.5 |
| c. Masonry Prism Tests | 2105A.2.2.2 |
| d. Masonry Core Tests | 2105A.4 |
| e. Masonry Unit Tests | 2105A.2.2.1 |
| f. Reinforcing Bar Tests | 1916A.2 |

3. Inspection

- | | |
|---------------------------------------|-----------|
| a. Reinforced Masonry | 1704A.5 |
| b. Reinforcing Bar Welding Inspection | 1704A.4.2 |

B. Unit Masonry Standard: Comply with ACI 530.1/ASCE 6 "Specifications for Masonry Structures," except as otherwise indicated.

1. Revise ACI 530.1/ASCE 6 to exclude Sections 1.4 and 1.7; Parts 2.1.2, 3.1.2, and 4.1.2; and Articles 1.5.1.2, 1.5.1.3, 2.1.1.1, 2.1.1.2, and 2.3.3.9 and to modify Article 2.1.1.4 by deleting requirement for installing vent pipes and conduits built into masonry.
2. 2013 CBC, Chapter 21 A.

C. Division of the State Architect Requirements:

1. Comply with the D.S.A. "Interpretation of Regulations" (I.R.) No. 21.2 "Concrete Masonry High-Lift Grouting Method" where high lift grouting is used.

D. Preconstruction Testing: Owner will employ and pay a qualified independent testing laboratory to perform the following preconstruction testing indicated as well as other inspecting and testing services required by referenced unit masonry standard or indicated herein for source and field quality control:

1. Clay unit masonry tests: For each different clay masonry unit indicated, units will be tested per ASTM C 67 and 2013 CBC.
 2. Concrete Masonry Unit Tests: For each different concrete masonry unit indicated, units will be tested for strength, absorption, and moisture content per ASTM C 140, and ASTM C 426.
- E. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- F. Single-Source Responsibility for Mortar and Grout Materials: Obtain Mortar and Grout ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.
- C. Store cementitious materials off the ground, under cover, and in dry location.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

1.8 PROJECT CONDITIONS

- A. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.
- B. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
- C. Protect sills, ledges, and projections from mortar droppings.
- D. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.
- E. Cold-Weather Construction: Comply with referenced unit masonry standard for cold-weather construction and the following:
1. Do not lay masonry units that are wet or frozen.

2. Remove masonry damaged by freezing conditions.
- F. Hot-Weather Construction: Comply with referenced unit masonry standard.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated. Aggregate used in masonry components shall be non-reactive.

2.2 MASONRY UNITS

- A. Face Brick Units: ASTM C 216 and CBC Chapter 21 A and as follows:
 1. Grade and Unit Compressive Strength: Provide units of grade and minimum average net area compressive strength indicated below:

Grade MW or SW/4,000 P.S.I. Type FBX-except for changes indicated herein.

 - a. Aggregate length of chips shall not exceed 3% of the perimeter of the face of the brick.
 - b. Face of brick shall be free of cracks or other imperfections when viewed from fifteen (15) feet.
 - c. Chippage in inches from edge - 1/8" maximum. From corner - 1/4" maximum.
 - d. No texture defects are allowed that can be seen from ten (10) feet away.
 2. Size: Provide bricks manufactured to the following actual dimensions within the tolerances specified in ASTM C 216, FBS – SW--except for changes indicated herein.

Common Jumbo: 3 inches thick by 3-1/2 inches high by 11-1/2 inches long. Color to be selected from standard colors.

Special Sizes: as indicated on plans.
 3. Wherever shown to "match existing," provide face brick of matching color and texture as existing adjacent brickwork.
 4. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 - a. Higgins Brick Company.
 - b. H.C. Muddox.
 - c. Interstate Brick.
- B. Concrete Block Units:
 1. Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.
 2. Size: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings.

3. Manufacturing Standard: ASTM C 90, Grade N Type 1. Provide units with minimum average net area compressive strength of 2,000 P.S.I. Refer to CBC table 2105A.2.2.1.2 for additional requirements.
4. Weight Classification: Normal Weight.
5. Color and Pattern: Integral color /pattern – see drawings.
6. Sizes: See drawings.

C. Clay Block Units:

1. Provide clay masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification. Compressive strength of units shall be 4,000 psi minimum.
2. Size: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings. Nominal size of units shall be 8 x 4 x 12.
3. Manufacturing Standard: ASTM C-652 and C-212.
4. Color and Pattern: Red color to match existing campus brick color.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, with the following exceptions:

1. The cement shall not contain more than 0.60 percent total alkali when calculated as Sodium Oxide.
2. The percentage of Tricalcium Silicate shall not be limited.
3. Cement shall be stored in such a manner as to protect it from inclusion of foreign material and damage by moisture. Only one (1) brand of cement shall be used for this work.
4. Provide natural color or white cement as required to produce mortar color.
 - a. Mortar color – integral color as selected.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: ASTM C 144.

D. Aggregate for Grout: ASTM C 404.

E. Water: Clean and potable.

F. Admixture: No admixture shall be used in mortar or low lift grout. Sika "Grout Aid", Type II shall be used in all high lift grout.

G. Mortar shall comply with CBC Chapter 21 A and ASTM C270 types, with a compressive strength of 2000 PSI.

H. Grout shall comply with ASTM C476 with a compressive strength of 2,000 PSI.

2.4 REINFORCING STEEL

- A. General: Provide reinforcing steel complying with requirements of referenced unit masonry standard and this article.

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- B. Steel Reinforcing Bars: Material and grade as follows:
 - 1. Billet steel complying with ASTM A 615.
 - 2. Grade 60, except where rebending is required, use Grade 40.
- C. Joint Reinforcing. 2013 CBC.

2.5 TIES AND ANCHORS, GENERAL

- A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of referenced unit masonry standard and of this article.
- B. Galvanized Carbon Steel Wire: ASTM A 82, coating class as required by referenced unit masonry standard for application indicated.
- C. Wire Diameter: 0.148 inch (#9 ga.).
- D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AA Wire Products Co.
 - 2. Dur-O-Wal, Inc.
 - 3. Heckman Building Products, Inc.
 - 4. Hohmann & Barnard, Inc.
 - 5. Masonry Reinforcing Corp. of America
 - 6. National Wire Products Industries
 - 7. Southern Construction Products, Inc.
 - 8. The Burke Company
- E. Bent Wire Ties
 - 1. Individual units prefabricated from bent wire to comply with requirements indicated below:
 - a. Type for Masonry where coursing between wythes align: Unit ties bent from one piece of wire.
 - b. Type for Masonry where coursing between wythes does not align: Adjustable ties composed of two parts, one with pintles, the other with eyes, maximum misalignment 1-1/4 inches.
- F. Galvanized Veneer Ties: 14 gage galvanized ties sizes as noted on plans.

2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. Water Repellent Coating:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. "Siloxane WB Concentrate" as manufactured by Sure Klean.
 - 2. Typical Technical Data:

Form:	Clear Amber Liquid
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Specific Gravity:	0.96
pH:	NA
Wt/Gal:	7.9 lbs.
Active Content:	100%
Total Solids:	48% ASTM D5095
Flash Point:	69°F (21°) concentrate ASTM D3278
	140°F (60°C) in 1:9 dilution
	145°F (62°C) in 1:14 dilution
Freezing point:	<-22°F (<-30°C)
Shelf Life:	1 year in tightly sealed, unopened container

3. Product shall be California VOC compliant and accepted in the county where project site is located.

B. Masonry Cleaner:

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. "Vana Trol" or "600 Detergent" as manufactured by Sure Klean.

2.7 MORTAR AND GROUT MIXES

- A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated. Sika "Grout Aid", Type II shall be used in all high lift grout.

Do not use calcium chloride in mortar or grout.

- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar indicated below:
 1. Limit cementitious materials in mortar to Portland Cement-lime.
 2. For reinforced masonry and where indicated, use type indicated below:
Type S.
 3. Grout for Unit Masonry: Comply with ASTM C 476, referenced standards and DSA requirements. Minimum (28 days) compressive strength = 2,000 P.S.I.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examining conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.
 1. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

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- A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.
- B. Thickness: Build composite walls and other masonry construction to the full thickness shown.
- C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.
- D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.
- E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full size units without cutting where possible.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of new masonry with existing masonry.

3.3 CONSTRUCTION TOLERANCES

- A. Comply with construction tolerances of referenced unit masonry standard.

3.4 INSTALLATION OF REINFORCED UNIT MASONRY

- A. General:
 - 1. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
 - 2. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
 - 3. Bond Pattern for Masonry: Lay masonry in the following bond patterns; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
 - a. Stack bond.
 - b. One-third running bond.
 - c. See plans for bond pattern.
 - 4. Lay concealed masonry and wythe facing interior of Mechanical Yard with all units in a wythe in a running bond. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
 - 5. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.
 - 6. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
 - 7. Fill space between hollow metal frames and masonry solidly with mortar unless

otherwise indicated.

B. Temporary Formwork:

1. Construct formwork and shores to support reinforced masonry elements during construction.
2. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
3. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
4. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

C. Preparation: All masonry units shall be clean and free from dust, grease, or other objectionable material.

D. Joints:

1. Brick units shall be laid in stack bond to match existing. Block units shall be laid in running (common) bond. All units shall be laid with three-eighths inch (3/8") minimum thick mortar bed on entire horizontal surface. Vertical joints shall be full-shoved head joints 3/8" wide.
2. Mortar joints shall be straight, clean and uniform in thickness and shall be tooled with a round bar to produce a dense, slightly concave surface well bonded to the block at the edges.

E. Alignment: Block shall be laid in such a manner as to preserve the unobstructed vertical continuity of the cavity to be filled. The minimum unobstructed grout space shall be 3-1/2". Any overhanging mortar or other obstruction or debris shall be removed from inside the cells and from the reinforcing.

3.5 MORTARS AND GROUT STRENGTH

- A. Mortar shall be sampled and tested in accordance with the provisions of Section 014000 of this specification and shall have the following minimum strengths: 1200 PSI in 7 days and 2000 PSI in 28 days.
- B. Grout shall be sampled and tested in accordance with the provisions of Section 014000 of this specification and shall have the following minimum strengths: 1200 PSI in 7 days and 2000 PSI in 28 days.

3.6 MIXING OF MORTAR

- A. Materials for mortar shall be measured in suitable calibrated devices. Shovel measurements will not be accepted. The lime shall be the last material added to the mix.
- B. The mortar materials and the maximum amount of water to produce a workable consistency shall be mixed for at least 3 minutes in a mechanical batch mixer.
- C. Retempering of mortar shall be done only by adding water into a basin made with the mortar and carefully working the water into the mortar. Mortar shall not be used that is non-plastic

or over 1-1/2 hours old.

3.7 PLACING OF REINFORCEMENT

- A. Cleaning: Before use, reinforcement shall be cleaned so as to be free of mortar, oil, dirt, loose mill scale, excessive rust or other coatings that would destroy or reduce the bond.
- B. Bending: Bends shall be made around a pin having diameter of not less than four (4) times the bar diameter for stirrups and ties and six (6) times the bar diameter for other bars except for bars larger than one inch (1") which shall be eight (8) times the bar diameter. Bars shall be bent cold.
- C. Dowels: This contractor shall supervise and be responsible for the proper installation of reinforcing dowels by others. Dowels shall not be bent to obtain the proper alignment with the vertical cell.
- D. Splicing:
 - 1. Splices shall be made with a lap of at least forty-eight (48) bar diameters unless otherwise noted. The bars shall be placed in contact and wired together in such a manner as to maintain the proper clearances.
 - 2. In general, horizontal splices shall be staggered at least four feet (4'-0").
 - 3. No splices in the vertical reinforcement will be allowed unless shown on the drawings.
- E. Placing:
 - 1. Reinforcing shall be accurately placed in accordance with the drawings and shall be fully embedded in grout and shall not be bedded in mortar or mortar joints except for wall mesh as indicated on the drawings. There shall be one-half inch (1/2") minimum clearance between any bar and masonry.
 - 2. Where the low-lift grouting method is used, the vertical bars shall be placed prior to the erection of the wall and shall be held in position at top and bottom and at intervals not exceeding 192 diameters of the reinforcement with at least No. 16 gage annealed wire.
 - 3. All reinforcement that will be included in a grout pour shall be positioned and wired in place before the cells are grouted. It is not permissible to "stick" the bars in the grout.
 - 4. Placing Requirements for High Lift Grout Method: Both horizontal and vertical reinforcing shall be held in position by wire ties or spacing devices near ends and at intervals not exceeding one hundred sixty (160) diameters of the reinforcement. The horizontal reinforcing shall be placed as the work progresses and the vertical reinforcing shall be placed prior to the erection of wall.

3.8 EMBEDDED ITEMS

- A. The Contractor shall cooperate with all tradesmen to insure that all conduit, anchor bolts, sleeves, inserts, hangers, hollow metal door frames, etc., are properly installed and secured in correct position. All embedded items shall be thoroughly clean and free from rust, scale, oil or other foreign matter.
- B. Pipes, other than electrical conduit, shall not be embedded in masonry. Rigid electrical conduit may be embedded in structural masonry in locations indicated on the approved drawings.

- C. All embedded items shall be accurately and securely set in place before the grouting of the cells is started. All bolts shall be set in place by using a wood template. All bolts shall be grouted in place with not less than one inch of grout between the bolt and the masonry.

3.9 GROUT - HIGH LIFT GROUTING METHOD (See T. 24, Sec. 2104A)

- A. The method of grouting, either the high lift or the low lift method, shall be as specified.
- B. The high lift method shall conform to the provisions of IR 21-2, Division of the State Architect, Structural Safety Section.
- C. The following is a summary of the major points of IR 21-2, which shall be obtained for further details.

1. General:

- a. The contact surface of all foundations that are to receive masonry work shall be cleaned and roughened in accordance with T. 24, Construction Joints, or by sand blasting.
- b. Cleanout openings shall be provided at the bottom of each pour in accordance with CBC, Section 2104A.6.1.1.3. A sand blanket shall be provided over the exposed surface of the foundation to prevent mortar droppings from bonding to it. Mortar overhangs and droppings shall be removed from the cell walls and the reinforcing by rodding.

2. Grouting:

- a. Proportions: The Contractor shall propose to the Architect Laboratory Designed Mixes based on the limitations prescribed below. The mix design shall be approved prior to use. The Contractor shall pay for the cost of the grout mix design.

<u>Material</u>	<u>Proportions</u> (Based on dry, loose volume)
Cement	1.0
Sand	3.0
Pea Gravel	1.5 to 1.8

Minimum Cement Content: 6.3 sacks per cu. yd.

Required Admixture: Sika "Grout Aid" II
(6# cu. yd.)

Slump: Nine (9) to ten (10) in.

- b. Grouting shall be done in one (1) continuous operation from the top of the footing to top of wall in four foot (4'-0) lifts. No horizontal construction joints are permitted but vertical construction joints can be used in locations approved by the Engineer. Each lift of grout shall be vibrated with a mechanical vibrator. There shall be a waiting period of one-half (1/2) to one (1) hour between lifts to allow each lift to consolidate before pouring the next lift. In vibrating the upper lifts, the vibrator shall be dropped down twelve inches (12") to eighteen inches (18") into the preceeding lift in alternate cells to reconsolidate it. The top lift shall be reconsolidated also after the waiting period and topped off with grout.

- 3. During construction, the ungrouted walls shall be adequately braced against wind

and other forces.

3.10 GROUT - LOW LIFT GROUTING - See. T. 24, Sec. 2104A.6.1.1.2.

- A. The method of grouting, either the high lift or the low lift method, shall be as specified.
- B. Proportioning:
 - 1. Per approved mix design (based on loose volumes):

Portland cement.....1 part
Sand.....2-1/4 (min.) to 3 (max.) parts
Pea Gravel.....1 (min.) to 2 (max.) parts
 - 2. Water: Add the amount necessary to cause the grout to flow into all joints of the masonry without segregation.
 - 3. Mixing shall be as specified for a mixing of mortar.
- C. Placing:
 - 1. In low-lift construction, units shall be laid to a maximum of 4 feet before grouting and all over-hanging mortar and mortar droppings shall be removed. Grouting shall follow each 4 feet of construction laid and shall be consolidated so as to completely fill all voids and embed all reinforcing steel.
 - 2. When grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the grout 1/2" below the top of the unit.
 - 3. Grouting of beams over openings shall be done in a continuous operation.
 - 4. All grout shall be rodded with a heavy reinforcing bar or vibrated with a mechanical vibrator immediately after placing.

3.11 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 - 5. Clean masonry by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised" using masonry cleaner.
 - 6. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 8-

- 4A and NCMA TEK 8-2A for removal of stain(s) present on exposed surfaces.
7. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Notice of Completion.

3.12 WATER REPELLANT COATINGS

A. General:

1. Brick surface shall be clean and surface dry prior to application.
2. Neutralize alkalis and remove efflorescence salts prior to application.
3. Protect surfaces to remain uncoated.
4. Provide adequate ventilation.
5. Avoid prolonged inhalation of vapors and contact with skin or eyes.
6. Weather shall be clear and no precipitation expected before or following application for at least 24 hours.
7. Keep materials away from fire or flames.

B. Coverage:

Coverage of product is recommended between 100 to 200 square feet per gallon dependent on density and absorption of brick. The test panel will help to identify actual coverage rate required.

C. Application:

1. Mortars and grout shall have been allowed to cure a minimum of 28 days.
2. Remove and repoint any damaged mortar or cracks in the mortar joints exceeding .02" (approximate thickness of a business card).
3. Allow repointed mortar to cure 7 days prior to application.
4. All caulking and sealant work must be done and allowed to cure completely before application of water repellents. (Refer to manufacturer's recommendations.)
5. Assure that all surfaces are clean and dry.
6. All materials, along with the surrounding air, must be maintained above 45° F (Fahrenheit degrees) during application.
7. Test a small area of surface to insure compatibility with existing conditions, and to establish proper coverage rates.
8. Do not dilute or alter water repellents.
9. Apply water repellent from the bottom of the wall up. Initially fog the wall down with a fine mist, followed by flooding the wall with a minimum 8" rundown using a manual pump low-pressure sprayer. Roll or brush out excessive drip areas.

3.13 PROTECTION

- A. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure masonry is without damage and deterioration at time of Notice of Completion.

END OF SECTION 042000

SECTION 079200 - JOINT SEALANTS

05/21/15

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but is not limited to the following sealants for the following applications, including those specified by reference to this Section (refer to Joint Sealer Schedule on construction documents for additional requirements):
 - 1. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:
 - a. Control and expansion joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - 2. Exterior joints in the following horizontal traffic surfaces:
 - a. Control, expansion, and isolation joints in cast-in-place concrete walks.
 - b. Other joints as indicated.
- B. Related Sections include the following:
 - 1. Division 4 Section "Unit Masonry" for masonry control and expansion joint fillers and gaskets.
 - 2. Division section " " for expansion joint filler.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each type and color of joint sealant required. Install joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished

comply with requirements and are suitable for the use indicated.

- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- G. Warranties: Special warranties specified in this Section.
- H. Project Closeout Requirements:
 - 1. 5-year installer warranty.
 - 2. 5-year manufacturer's warranty.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates as follows:
 - 1. Locate test joints where indicated or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of nonelastomeric sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
 - 5. Test Method: Test joint sealants by hand-pull method described below:
 - a. Install joint sealants in 60-inch- (1500-mm-) long joints using same materials and methods for joint preparation and joint-sealant installation required for the completed Work. Allow sealants to cure fully before testing.
 - b. Make knife cuts from one side of joint to the other, followed by two cuts approximately 2 inches (50 mm) long at sides of joint and meeting cross cut at one end. Place a mark 1 inch (25 mm) from cross-cut end of 2-inch (50-mm) piece.
 - c. Use fingers to grasp 2-inch (50-mm) piece of sealant between cross-cut end and 1-inch (25-mm) mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this

- position for 10 seconds.
 - d. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.
- 6. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
- 7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
 - 2. When joint substrates are wet.
- B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five (5) years from date of Notice of Completion.
- C. Special Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer

agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five (5) years from date of Notice of Completion.

D. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified in the Sealant Data Sheets at the end of Part 3.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range for this characteristic.

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant in the Elastomeric Joint-Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.
- B. Additional Movement Capability: Where additional movement capability is specified in the Elastomeric Joint-Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.
- C. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

2.4 PREFORMED JOINT SEALANTS

- A. Preformed Silicone-Sealant System: For each product of this description provide manufacturer's standard system consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.
- B. Preformed Foam Sealants: For each product of this description indicated in the Preformed Joint-Sealant Schedule at the end of Part 3, provide manufacturer's standard preformed, precompressed, impregnated, open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water-repellent agent; factory produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following:
 - 1. Properties: Permanently elastic, mildew resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
 - 2. Impregnating Agent: Manufacturer's standard.
 - 3. Density: Manufacturer's standard.
 - 4. Backing: Pressure-sensitive adhesive, factory applied to one side with protective wrapping.
 - 5. Available Products: Subject to compliance with requirements, preformed foam sealants that may be incorporated in the Work include, but are not limited to, the following:
 - a. "Emseal," Emseal Corp.
 - b. "Emseal Greyflex," Emseal Corp.
 - c. "Wil-Seal 150," Wil-Seal Construction Foams Div., Illbruck.
 - d. "Wil-Seal 250," Wil-Seal Construction Foams Div., Illbruck.

2.5 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
 - 1. Type C: Closed-cell material with a surface skin.
 - 2. Type O: Open-cell material.
 - 3. Type B: Bicellular material with a surface skin.
 - 4. Type: Any material indicated above.
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
 - a. Metal.
 - b. Glass.
 - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.
- F. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses provided for each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- G. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealants from surfaces adjacent to joint.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - 4. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.
 - 5. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.
 - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
- H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, to produce seal continuity at ends,

turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant to comply with sealant manufacturer's written instructions.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Project Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

ELASTOMERIC JOINT SEALANT DATA SHEET

Elastomeric Joint Sealant Designation: ES #1.

Base Polymer: Polysulfide/polyurthane.

Type: M (multicomponent).

Grade: P (pourable).

Class: 25.

Use[s] Related to Exposure: T (traffic)/40+/-5 shore harnes.

Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.

Use O Joint Substrates: Color anodized aluminum, aluminum coated with a high-performance coating, galvanized steel, brick, granite, marble, ceramic tile, and wood.

Available Products:

Flat to 1/8"/ft. slope

1. "Deck-O-Seal #125", D.F.C. Company
2. "Elasto-Seal 227 - Self-Leveling", Pacific Polymers.
3. Sika 2C.

1/8"/ft.&greater slope

1. "Deck-O-Seal Gun Grade", D.F.C. Co.
2. "Elasto-Seal Gun Grade", Pacific Polymers.
3. Sika 2C Non-Sag.

ELASTOMERIC JOINT SEALANT DATA SHEET

Elastomeric Joint Sealant Designation: ES #2.

Base Polymer: Neutral-curing silicone.

Type: S (single component).

Grade: NS (nonsag).

Class: 25.

Additional Movement Capability: 100 percent movement in extension and 50 percent in compression for a total of 150 percent movement.

Use[s] Related to Exposure: NT (nontraffic).

Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

Use O Joint Substrates: Coated glass, color anodized aluminum, aluminum coated with a high-performance coating, galvanized steel, brick, granite, marble, ceramic tile, and wood.

Available Products:

1. "SIKAFLEX 2C NSE2", SIKA.
2. Or equal.

END OF SECTION 079200

SECTION 101423 - SIGNS

4/18/17

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but not limited to, the following items:

- 1. Panel signs in aluminum frames.
- 2. Walls signs in aluminum frames.
- 3. Door signs in aluminum frames.
- 4. Door signs - frameless.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: Include manufacturer's construction details relative to materials, dimensions of individual components, profiles, and finishes for each type of sign required.
- C. Shop Drawings: Provide shop drawings for fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, reinforcement, accessories, layout, and installation details.
 - 1. Provide message list for each sign required.
 - 2. Samples for verification of color, pattern, and texture selected, and compliance with requirements indicated:
 - a. Cast Lexan Sheet and Plastic Laminate: Provide a sample panel not less than 8-1/2 inches by 11 inches for each material indicated. Include a panel for each color, texture, and pattern required. On each panel include a representative sample of the graphic image process required, showing graphic style, and colors and finishes of letters, numbers, and other graphic devices.
 - b. Dimensional Letters: Provide full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
- D. Project Closeout Requirements:
 - 1. Cleaning and maintenance data.
 - 2. 5-year warranty.

1.4 QUALITY ASSURANCE

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- A. Design Criteria: The drawings indicate size, profiles, and dimensional requirements of signs and are based on the specific design indicated. Signs by other manufacturers may be considered provided that deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.
- B. All signs text, Braille, raised copy, mounting heights/requirements shall be per ADA Compliance and CBC Sections 11B-216.2 through 11B-216.3, 11B-216.3 through 11B-216.10 and 11B-703.1 through 11B-703.7.2.7.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.
- B. Sign Contractor shall meet with Architect and Owner, at project site at no cost, to discuss text of signs and review optional text to fit format of signs.

1.6 WARRANTY

- A. All signs shall be under warranty for peeling, fading, defects, and cracking for five (5) years from Notice of Completion date.
- B. The warranty submitted under this Section shall not deprive the Owner of other rights or remedies that the Owner may have under other provisions of the Contract Documents and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

1.7 REGULATORY REQUIREMENTS

- A. All signage and related items shall comply with the California Building Code as follows:
 - 1. All signage shall conform to CBC Sections 11B-216.8 and 11B-703.
 - 2. Tactile exit signage shall be provided per CBC Sections 1143A, 1011.4 and 11B-703.2.
 - 3. All sign text, Braille, raised copy, mounting heights/requirements shall be per ADA Compliance and CBC Sections 11B-216.2 through 11B-216.3, 11B-216.3 through 11B-216.10 and 11B-703.1 through 11B-703.7.2.7.
 - 4. Character Type: Characters on signs shall be raised 1/32 inch (0.794mm) minimum and shall be sans serif uppercase characters accompanied by Grade 2 Braille (see below).
 - 5. Character Size: Raised characters shall be a minimum of 5/8 inch (15.9 mm) and a maximum of 2 inches (51 mm) high.
 - 6. Finish and Contrast: Contrast between characters, symbols and their background must be 70% minimum and have a non-glare finish. CBC Sections 11B-703.5.1, 11B-703.6.2 and 11B-703.7.1.
 - 7. Proportions: Characters on signs shall have a width-to-height ratio of between 3:5 (60%) and 11:10 (110%) and a stroke thicker-to-height ratio of 3:20 per CBC Sections 11B-703.2.4 and 11B-703.2.6.All letters measured must be uppercase. After choosing a typestyle to test, begin by printing the letters I, X, and O at 1 inch height. Place the template's 11:10 (110%) square over the X or O, whichever is narrower. If the character is not wider than 1 inch, nor narrower than the 3:5 (60%) rectangle, the proportions are correct. Use the 3:20 (15%)

rectangle to determine if the stroke of the "I" is too broad or too narrow. If all the tests are passed, the typestyle is compliant with proportion code.

8. Braille: California Contracted Grade 2 Braille shall be used whenever Braille is required. Dots shall be spaced 0.10 inch (2.50 mm) on center in each cell, with 0.20 inch (5.18 mm) space between cells, measured from the second column of dots in the first cell to the first column of dots in the second cell. Braille with multiple lines to be spaced between 0.395 inch (10 mm) and 0.4 inch (10.2 mm) between corresponding dots from one cell directly below. Dots shall be raised between 0.025 inch (0.6mm) and 0.037 inch (0.9mm) above background with domed or round tops. CBC Section 11B-703.3.9.
9. All Interior fire alarm signage shall conform to CFC 509.1.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers and specific designs on Drawings are not limited to, the following:
 1. Manufacturers of Panel Signs:
 - a. ASI Sign Systems, Inc.
 - b. Acclaim Signs (530 346-9660)

2.2 PANEL SIGNS

- A. Panel Signs: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
 1. Produce smooth, even, level sign panel surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally.
 2. Provide additional backing in sign for sign surface to remain flat with a 15# load to front face.
- B. Framed Panel Signs: Fabricate frames to profile indicated; comply with the following requirements for materials and corner conditions:
 1. Frame Material: Aluminum, extruded or cast - 3/4" wide.
 2. Face Material: Lexan 1/4" - unless noted otherwise.
 3. Corner Condition: Corners rounded to radius indicated.
 4. Color: Paint colors as selected; electrostatic powder coating or automobile paint.
- C. Laminated Sign Panels: Permanently laminate face panels to backing sheets of material and thickness indicated using the manufacturer's standard process.
- D. Brackets: Fabricate brackets and fittings for bracket-mounted signs from extruded aluminum to suit sign panel construction and mounting conditions indicated. Factory-paint brackets in a color matching the background color of the sign panel.
- E. Graphic Content and Style: Provide sign copy that complies with the requirements indicated for size, style, spacing, content, position, material, finishes, and colors of letters, numbers, and other graphic devices.

- F. Subsurface Copy: Apply copy to the back face of clear Lexan sheet forming the panel face by process indicated to produce precisely formed opaque images, free from rough edges.
 - 1. Use reverse silk-screen process, or approved equal, to print copy; overspray the copy with an opaque background color coating.
 - 2. Use Arlon "Calon" heat and pressure-laminated photopolymer film system to form copy and background color.
 - a. The manufacturer has the option of selecting either process indicated above.
 - b. The manufacturer has the option of selecting either process indicated above, or using subsurface engraving process, as appropriate to the copy form and the economics of production.
- G. Braille: California Contracted Grade 2 Braille, embedded balls, finish Lexan. Dots shall be 0.10 inch (2.50 mm) on center each cell with 0.20 inch (3.08 mm) spaces between cells. Braille with multiple lines to be spaced between 0.395 inch (10 mm) and 0.4 inch (10.2 mm) between corresponding dots from one cell directly below. Dots shall be raised between 0.025 inch (0.6mm) and 0.037 inch (0.9mm) above background.
- H. Raised Letters/Graphics/Pictograms: 1/32" (0.794 mm) raised item laminated to sign surface ABS 500 Natural Extrusion Mfg. by Don Chemical.
 - 1. Character shall be 5/8" (15.9 mm) minimum height and 2" (51 mm) maximum height.
 - 2. Character shall be Helvetica Medium uppercase characters.
 - 3. Contrast between characters, symbols and background shall be 70% minimum and non-glare finish.
 - 4. Characters on signs shall have a width-to-height ratio between 3:5 and 11:10 and a stroke thickness-to-height ratio of 3:20.
- I. Exterior application requirements where sign is shown not inside the building.
 - 1. Seal gasket to prevent water intrusion.
 - 2. Sign back plate with seal gasket.
 - 3. Weep holes at bottom to exterior.
 - 4. Tamperproof screws - stainless steel.

2.3 FINISHES

- A. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Architect from the manufacturer's standards.
- B. Metal Finishes: Automotive finish paint system. PPG Deltron with compatible primers and additives. Architect will accept electrostatic powder coating finish – exterior grade as acceptable finish.
- C. Aluminum Finishes: Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
 - 1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
 - 2. Provide additional shims and sign integral backing material such that sandwiched sign assembly has no movement front to rear,
- B. Wall Mounted Panel Signs: Attach panel signs to wall surfaces using the methods indicated below:
 - 1. Shim Plate Mounting: Provide concealed aluminum shim plates .060" thick interior and .090" thick at exterior, with predrilled and countersunk holes, at locations indicated and where other mounting methods are not practicable. Attach the plate with concealed fasteners and anchors suitable for secure attachment to the substrate. Attach panel sign units to the plate using the method specified above.

3.2 CLEANING AND PROTECTION

- A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION 101423

SECTION 01 26 00 – GENERAL ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

This section includes general requirements specifically applicable to Divisions 26, 27, & 28; including requirements from Division 1.

1.2 RELATED SECTIONS

- A All included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Standards
 - 1 AEIC – Association of Edison Illuminating Companies
 - 2 ANSI – American National Standards Institute
 - 3 ASTM – American Society of Testing and Materials
 - 4 CBM – Certified Ballast Manufacturers Association
 - 5 EIA – Electronic Industry Association
 - 6 ICEA – Insulated Cable Engineers Association
 - 7 IEEE – Institute of Electrical and Electronics Engineers
 - 8 NEMA – The Association of Electrical and Medical Imaging Equipment Manufacturers
 - 9 FM - Factory Mutual
 - 10 UL – Underwriter's Laboratory's, Inc., Standards for Safety
- B Local codes and authorities having jurisdiction
 - 1 City codes
 - 2 County codes
 - 3 Local fire department
- C State codes and authorities having jurisdiction
 - 1 CBC – California Building Code
 - 2 CEC – California Electrical Code
 - 3 State of California Codes
- D National codes and authorities having jurisdiction
 - 1 NESC – National Electrical Safety Code
 - 2 OSHA – Occupational Safety and Health Act
- E Utilities
 - 1 Local cable company
 - 2 Local electrical company
 - 3 Local telephone company
- F Code compliance
 - 1 All work and materials shall comply with the latest rules, codes and regulations, including, but not limited to the following:

- a Occupational Safety and Health Act Standards (OSHA).
 - b CCR, Title 24, Part 3: California Electrical Code (CEC)
 - c All other applicable Federal, State and Local laws and regulations.
- 2 Code compliance is mandatory. Nothing in these Drawings and Specifications permits work not conforming to National, State, and Local electrical and building codes. Where work is shown to exceed minimum code requirements, comply with Drawings and Specifications.
- 3 No work shall be concealed until after inspection and approval by proper authorities. If work is concealed without inspection and approval, the Contractor shall be responsible for opening the concealed areas, making any required corrections and/or modifications to his work, and restoring the area to its previous condition.

1.4 DEFINITIONS (APPLICABLE TO DRAWINGS AND SPECIFICATIONS)

- A Provide: To supply, install and connect complete and ready for safe and regular operation of particular work referred to unless specifically otherwise noted.
- B Install: To erect, mount and connect complete with related accessories.
- C Supply: To purchase, procure, acquire and deliver complete with related accessories.
- D Work: Labor, materials, equipment, apparatus, controls, accessories and other items required for proper and complete installation.
- E Wiring: Raceway, fittings, wire, boxes, related items and connection.
- F Concealed: Embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces or in enclosures.
- G Exposed: Either visible or subject to mechanical or weather damage, indoors or outdoors, including areas such as mechanical and storage rooms. In general, any item that is directly accessible without removing panels, walls, ceiling or other parts of structure.
- H Indicated, Shown, or Noted: As indicated, shown or noted on Drawings or Specifications.
- I Above Grade: Not buried in ground and not embedded in concrete slab on ground.
- J Below Grade: Buried in ground or embedded in concrete slab on ground.
- K Underground: Buried in ground, including under building slabs.
- L Connect: Complete hookup of item with required services, including conduit, wire and other accessories.
- M Furnish: Supply and deliver complete.
- N Similar or Equal: Of base bid manufacturer, equal in materials, weight, size, design, and efficiency of specified product, equivalent to Base Bid Manufacturer's product.
- O Reviewed, Satisfactory, Accepted, or Directed: As reviewed, satisfactory, accepted or directed by or to engineer.
- P Motor Controllers: Manual or magnetic starters (with or without switches), individual pushbuttons, or hand-off-automatic (HOA) switches controlling the operation of motors.
- Q Control Devices: Automatic sensing and switching devices such as thermostats, pressure, float, electro-pneumatic switches and electrodes controlling operation of equipment.
- R Contractor: Electrical Sub Contractor unless stated otherwise.
- S Use (verb): Furnish and install as defined above.

1.5 LICENSES, FEES AND PERMITS

Pay for all City, County or State electrical licenses, fees and permits. Arrange for all required inspections by agencies or authorities having local jurisdiction. The owner shall pay for all inspection fees and permits.

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1.6 CONDITIONS AT SITE

- A A visit to the site is required of all bidders prior to submission of bid. All will be held to have familiarized themselves with all discernible conditions and no extra payment will be allowed for work required because of these conditions, whether specifically mentioned or not.
- B Underground or overhead lines or other services that are damaged as a result of this work shall promptly be repaired at no expense to the Owner and to complete satisfaction of the Owner.

1.7 DRAWINGS AND SPECIFICATIONS

- A All Drawings and all Divisions of these Specifications shall be considered as a whole and work of this Division shown anywhere therein shall be furnished under this Division.
- B The Contract Drawings are diagrammatic and indicate the general arrangement of equipment and wiring. Most direct routing of conduit and wiring is not assured. Exact requirements shall be governed by architectural, structural and mechanical conditions of the job. Consult all other Drawings in preparation of the bid. Extra lengths of wiring or addition of pull or junction boxes, etc., necessitated by such conditions shall be included in the bid. Check all information and report any apparent discrepancies before submitting bid.
- C Right is reserved to make change up to ten (10) feet in location of any outlet, device, or equipment prior to roughing in without increasing contract cost.
- D Equipment and fixtures shall be connected to provide circuit continuity in accordance with applicable codes, whether or not each piece of conductor, conduit or protective device is shown between items of equipment or fixtures and the point of circuit origin.

1.8 SAFETY AND INDEMNITY

- A Safety: The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours.
- B No act, service, Drawing review or construction review by Owner, the Architect, the Engineers or their Consultants, is intended to include review of the adequacy of the Contractor's safety measures, in on or near the construction site.

1.9 RECORD DRAWINGS

- A Submit record Drawings under provisions of Section 013000.
- B Submit prior to final acceptance inspection, one complete marked-up set of reproducible engineering design Drawings.
 - 1 Fully illustrate revisions made by crafts in course of work.
 - 2 Include field changes, adjustments, variances, substitutions and deletions, including Change Orders.
 - 3 Indicate exact location of raceways, equipment, and devices.
 - 4 Indicate exact size and location of underground and under floor raceways, grounding conductors, and duct banks.
 - 5 The record Drawings shall show all the work actually constructed and originally shown on the Drawing based upon the field construction by the Contractor.
- C These Drawings shall be for record purposes for Owner's use and are not considered Shop Drawings.

1.10 MANUFACTURER'S INSTRUCTIONS

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- A Where the Specifications call for an installation to be made in accordance with manufacturer's recommendations, a copy of such recommendations shall at all times be kept in the job superintendent's office and shall be available to the Owner's representative.
- B Follow manufacturer's instructions where they cover points not specifically indicated on Drawings and Specifications. If they are in conflict with the Drawings and Specifications, obtain clarification from the Architect or Engineer before starting work.
- C One (1) set of equipment manufacturer's Drawings shall be submitted to the Engineer for their record.

1.11 OPERATING AND MAINTENANCE MANUALS

- A Operating and maintenance manuals and close-out documents are used interchangeably
- B Submit operating and maintenance manuals of equipment in the following format. Owner shall decide which format they prefer.
 - 1 Three (3) hardcopy sets
 - 2 PDF format
- C For specific requirements, see the sections in which the equipment is specified.

1.12 QUALITY ASSURANCE

- A Provide a meaningful quality assurance program. To assist the Contractor in this program, the Specifications contained herein are set forth as the minimum acceptable requirements. This does not relieve the Contractor from executing other quality assurance measures to obtain a complete operating facility within the scope of this project.
- B The Contractor shall insure that workmanship, materials employed, required equipment and the manner and method of installation conforms to accepted construction and engineering practices, and that each piece of equipment is in satisfactory working condition to satisfactorily perform its functional operation.

1.13 GUARANTEE

Guarantee the installation free from defects of workmanship and materials for a period of one (1) year after Date of Certificate of final payment and promptly remedy any defects developing during this period, without charge.

1.14 BIDDING

- A The contractor shall bid on the plans, specifications, etc. that constitute the contract documents.
- B The contractor shall not attempt to modify the contract documents without the approval of the electrical engineer.
- C All "value engineering" proposals shall be submitted in to the electrical engineer writing.
- D If the contractor makes changes to the contract documents not approved by the electrical engineer, the contractor will still be responsible for installing all devices, conductors, conduits, etc. the contract documents call for.

1.15 ABBREVIATIONS

AES	Advanced Encryption Standard
AIC	Amps interrupting capability
ANSI	American National Standards Institute
ASTM	ASTM International, formerly American Society for Testing and Materials

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ATC	Astronomical time clock
CATV	Cable television
CBC	California Building Code
CCTV	Closed circuit television
CEC	California Electrical Code
CFC	California Fire Code
CFR	Code of Federal Regulations
CMC	California Mechanical Code
CPC	California Plumbing Code
CSFM	California State Fire Marshal
DPDT	Double pole, double throw
DPST	Double pole, single throw
DSA	Division of the State Architect
DVR	Digital video recorder
EIA	Electronic Industries Association
EMT	Electrometallic conduit
EOR	Engineer of record
FACP	Fire alarm control panel
FMC	Flexible metallic conduit
GRS	Galvanized, rigid steel conduit
HVR	Hybrid video recorder
ICC-ES	International Code Council Evaluation Service
IDF	Intermediate data frame
IEEE	Institute of Electrical and Electronic Engineers
IMC	Intermediate metallic conduit
IOR	Inspector of record
IP	Internet protocol
ISO	International Organization for Standardization
LAN	Local area network
LCD	Liquid crystal display
LED	Light emitting diodes
MDF	Main data frame
NEC	National Electrical Code
NEMA	Association of Electrical Equipment and Medical Imaging Manufacturers
NETA	National Electrical Testing Association
NFPA	National Fire Protection Association
NICET	National Institute for Certification in Engineering Technologies
NIST	National Institute of Standards and Technology
OCPD	Overcurrent protection device
OSHPD	Office of Statewide Health Planning and Development
PDF	Portable document format
PG&E	Pacific Gas and Electric
PTZ	Pan, tilt, zoom
PVC	Polyvinyl chloride
SCCR	Short circuit current rating
SCE	Signal current expander
SCE	Southern California Edison
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SPD	Surge protective device
SPDT	Single pole, double throw
SPST	Single pole, single throw
THD	Total harmonic distortion
TIA	Telecommunications Industries Association

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TVSS	Transient voltage surge suppression/suppressor
UL	Underwriters' Laboratories
USB	Universal series bus
UPS	Uninterruptable power supply
VFD	Variable frequency drive
VFD	Vacuum fluorescent display
VOIP	Voice over Internet protocol
VPN	Virtual private network
WAN	Wide area network

PART 2 – PRODUCTS

2.1 MATERIAL APPROVAL

- A All materials must be new and bear Underwriters' Laboratories label. Materials that are not covered by UL testing standards shall be tested and approved by an independent testing laboratory or a governmental agency.
- B Material not in accordance with these Specifications may be rejected either before or after installation.
- C Materials or equipment specified by:
 - 1 Name of manufacturer.
 - 2 Brand or trade name.
 - 3 Catalog reference.

2.2 SUBSTITUTIONS

- A Base the bid on use of materials specified.
- B Equipment other than specified will be considered for approval provided it meets previous items A through C and the following is submitted in writing by the Contractor to the Engineer to allow approval at least 14 days before the bid date:
 - 1 The request for permission to substitute shall be accompanied with a statement of the amount of money to be returned to the contract if the substitution is permitted.
 - 2 Return a completed request for substitution form.
- C The engineer is the sole judge of acceptability of preferred substitutions.
- D If a substitute is permitted, and any re design effort is thereby necessitated, the required re design shall be at the Contractor's expense.

2.3 SUBMITTALS

Submit to architect, or engineer if no architect is involved, seven (7) copies of complete Shop Drawings and materials lists, as noted below, for review within thirty (35) days after award of contract. All proposed deviations from Specifications must be clearly listed and submitted separately under a prominent heading entitled "Substitutions."

- A Fire Alarm Systems
- B Communication Systems
- C Pull Boxes and Cabinets
- D Conduit and Wire
- E Service and distribution
- F Transformers

2.4 OPERATING AND MAINTENANCE MANUALS

Submit Operating and Maintenance Manuals of equipment as specified under Division 1. Verify exact quantity with architect, or engineer if no architect is involved.

2.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A Equipment shall be shipped in its original packages, to prevent damaging or entrance of foreign matter. Handling and shipping shall be performed in accordance with manufacturer's recommendations. Provide protective covering during construction.
- B Replace at no expense to Owner, equipment or material damaged during the storage or handling, as directed by the engineer.
- C Equipment shall be tagged with a weatherproof tag identifying equipment by name and purchase order number. Packing and shipping lists shall be included.

PART 3 – EXECUTION

3.1 CLEARANCE

Minimum code required clearances for electrical equipment shall not be violated.

3.2 WORKMANSHIP AND CONTRACTOR'S QUALIFICATIONS

- A Only quality workmanship will be accepted. Haphazard or poor installation practice will be cause for rejection of work.
- B The Electrical Contractor shall provide a Superintendent in charge of this work at all times to direct the quality of the installation.

3.3 COORDINATION

- A Coordinate work with other trades to avoid conflict and to provide correct rough in and connection for equipment furnished under other trades and requiring electrical connections. Inform Contractors of other trades of the required access to and clearances around electrical equipment to maintain serviceability and code compliance.
- B Verify equipment dimensions and requirements with provisions specified under this Section. Check actual job conditions before fabricating work. Report necessary changes in time to prevent needless work. Changes or additions subject to additional compensation and agreed price shall be at Contractor's risk and expense.
- C Provide temporary feeds and connections to areas and equipment as required to allow phased construction and operation.

3.4 CUTTING AND PATCHING

All cutting and patching required for work of this Division is included herein. Coordination with General Contractor and other trades is imperative. Contractor shall bear the responsibility for and bear the added expense of adjusting for improper holes, supports, etc.

END OF SECTION

REQUEST FOR SUBSTITUTION

To: _____

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A. _____ submits for your consideration the following product instead of the specified item:

1. Project: _____
2. Section or Sheet: _____, Article or Paragraph: _____
3. Specified Item: _____
4. Proposed Substitution (Mfg., Type, Model, etc.): _____

B. Complete all of the following:

1. Does this substitution off the Owner a cost credit (including costs for changes by other trades)? _____ How much? _____
2. Does this substitution offer earlier delivery or less construction time? _____
How much? _____ How so? _____
3. How does the substitution affect any dimensions, layout, or details of other trades as shown on the Drawings? _____

4. What are the specific differences between this substitution and the specified item?

C. Attach the following items.

1. Manufacturer's technical data _____
2. Laboratory test or performance results _____
3. Drawings and wiring diagrams of the proposed product _____
4. Drawings and description of changes required by other trades _____
5. Manufacturer's guarantee and maintenance instructions _____

D. The undersigned agrees to pay for all additional review, design, testing, changes in contract documents, and construction as a result of the acceptance of this substitution, at no cost to the Owner.

E. Submitted by (Firm) _____

Print name _____

Signature _____ Date _____

Accepted ☐ Rejected ☐ Revise and Resubmit ☐ See Attached ☐

END OF REQUEST FOR SUBSTITUTION

SECTION 26 05 00 – ELECTRICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.1 SECTION INCLUDES

Materials, equipment fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction, for the following:

- A Conduit and raceways
- B Wire and cables
- C Outlet boxes
- D Junction boxes
- E Pull boxes
- F Grounding

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

Published specification standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.

- A American Society for Testing and Materials
 - 1 ASTM B3: Standard Specification for Soft or Annealed Copper Wire
 - 2 ASTM B33: Standard Specification for Tin-Coated or Annealed Copper Wire for Electrical Purposes
 - 3 ASTM B738: Standard Specification for Fine-Wire Bunch-Stranded and Rope-Lay Bunch-Stranded Copper Conductors for Use as Electrical Conductors
 - 4 ASTM B355: Standard Specification for Nickel-Coated, Soft or Annealed Copper Wire
 - 5 ASTM D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
- B California Electrical Code (CEC)
- C Institute of Electrical and Electronic Engineers (IEEE)
 - 1 IEEE 81: Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System Part 1: Normal Measurements
 - 2 IEEE 82: Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors
 - 3 IEEE 95: Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors
 - 4 IEEE 141: Recommended Practice for Electric Power Distribution for Industrial Plants

- 5 IEEE 142: IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems
 - 6 IEEE 241: Recommended Practice for Electric Power Systems in Commercial Buildings
 - 7 IEEE 242: Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems (IEEE Buff Book)
 - 8 IEEE 442: Guide for Soil Thermal Resistivity Measurements
 - 9 IEEE 576: Recommended Practice for Installation, Termination, and Testing of Insulated Power Cable as Used in Industrial and Commercial Applications
- D Underwriters' Laboratories
- 1 UL 1: Flexible Metal Conduits
 - 2 UL 4: Armored Cable
 - 3 UL 5: Surface Metal Raceways and Fittings
 - 4 UL 5A: Nonmetallic Surface Raceways and Fittings
 - 5 UL 5B: Standard for Strut-Type Channel Raceways and Fittings
 - 6 UL 5C: Standard for Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits
 - 7 UL 6: Electrical Rigid Metal Conduit – Steel
 - 8 UL 13: Power Limited Circuit Cables
 - 9 UL 83: Thermoplastic Insulated Wires and Cables
 - 10 UL 310: Electrical Quick-connect Terminals
 - 11 UL 360: Liquid Tight Flexible Steel Conduit
 - 12 UL 444: Communications Cables
 - 13 UL 467: Grounding and Bonding Equipment
 - 14 UL 486A: Wire Connectors
 - 15 UL 486B: Wire Connectors
 - 16 UL 486C: Splicing Wire Connectors
 - 17 UL 486D: Sealed Wire Connector Systems
 - 18 UL 486E: Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
 - 19 UL 493: Thermoplastic Insulated Underground Feeder and Branch Circuit Cables
 - 20 UL 510: Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
 - 21 UL 514A: Metallic Outlet Boxes
 - 22 UL 514B: Conduit, Tubing, and Cable Fittings
 - 23 UL 514C: Nonmetallic Outlet Boxes, Flush-device Boxes, and Covers
 - 24 UL 514D: Cover Plates for Flush-mounted Wiring Devices
 - 25 UL 568: Nonmetallic Cable Tray System
 - 26 UL 635: Insulating Bushings
 - 27 UL 651: Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
 - 28 UL 797: Electrical Metallic Tubing – Steel
 - 29 UL 870: Wireways, Auxiliary Gutters, and Associated Fittings
 - 30 UL 969: Marking and Labeling Systems
 - 31 UL 1242: Standard for Electrical Intermediate Metal Conduit - Steel
 - 32 UL 1332: Organic Coatings for Steel Enclosures for Outdoor Use Electrical Equipment
 - 33 UL 1446: Systems of Insulating Materials – General
 - 34 UL 1479: Fire Tests of Through Penetration Firestops
 - 35 UL 1565: Position Devices (includes cable ties and clamps)
 - 36 UL 1581: Reference Standard for Electrical Wires, Cables, and Flexible Cords
 - 37 UL 1652: Flexible Metallic Tubing
 - 38 UL 1685: Vertical-tray Fire Propagation and Smoke Release Test for Electrical and Optical Fiber Cables
 - 39 UL 1773: Standard for Termination Boxes
 - 40 UL 1977: Component Connectors for Use in Data, Signal, Control, and Power Applications

- 41 UL 2024: Standard for Signaling, Optical Fiber and Communications Raceways and Cable Routing Assemblies
- 42 UL 2196: Test for Fire Resistive Cables
- 43 UL 2239: Hardware for the Support of Conduit, Tubing, and Cable
- 44 UL 2239: Hardware for the Support of Conduit, Tubing, and Cable
- 45 UL 2256: Nonmetallic Sheathed Cable Interconnects
- 46 UL 2257: Identification Tests for Jacket and Insulation Materials Used in Plenum Cables
- 47 UL 2556: Wire and Cable Test Methods

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Deliver, store and protect products under provisions of Section 016000.
- F Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- G Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- H Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 Calibration procedures and intervals
 - 7 A complete set of drawings for any special items
 - 8 Wiring diagrams
- C Electronic submittals shall be searchable
- D Seismic Restraint and Anchorage: Provide complete seismic anchorage and bracing for the lateral and vertical support of conduit and electrical equipment in accordance with CBC, Title 24, Part 2, Section 1615A.1 and ASCE 7-05 Section 13.6, and all provisions of this Section.
 - 1 Submit calculations prepared and signed by a Structural Engineer licensed in the State of California, showing compliance with the above for all electrical equipment weighing more than 50 pounds, excepting items corresponding exactly in configuration and weight to those specified and detailed. Where anchorage details are not shown on drawings, the field installation shall be subject to the approval of the Electrical Engineer.
 - 2 All equipment mounted on concrete shall be secured with steel stud expansion anchors requiring a drilled hole. Power driven anchors are not acceptable. Minimum spacing shall be 10 diameter center to center and 5 diameters center to edge of concrete. Maximum allowable stresses for tension and shear shall be

- 80% of the ICC Evaluation Services research or evaluation report values. Acceptable manufacturers are Hilti, Red Head, and Simpson Strong Tie.
- 3 Conduit and suspended equipment shall be provided with supports and seismic restraints in accordance with Unistrut, Inc. Seismic Bracing Guide, or Super Strut Inc., Seismic Restraint System guide. Support requirements shall be based upon similar equipment; i.e., water piping as equivalent to conduit with wire fill. A copy of the guide shall be on the job site during construction.
- E The submittal shall be substantially complete for all items and equipment furnished under this section.
- F Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- G Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Table of contents
 - 2 Manufacturer (including contact information)
 - 3 Model number
 - 4 Voltage ratings
 - 5 Current ratings
 - 6 List of capabilities
 - 7 Environmental ratings
 - 8 NEMA enclosure type
 - 9 Maintenance instructions and intervals
 - 10 Calibration procedures and intervals
 - 11 Installation instructions
 - 12 Repair instructions (where applicable)
 - 13 As-built drawings
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 CONDUIT AND OTHER RACEWAYS

- A Rigid Conduit, also referred to as Galvanized Rigid Steel Conduit (GRS)
 - 1 Material: High strength steel
 - 2 Coating
 - a All uses: hot-dipped galvanized
 - b Underground or corrosive areas
 - 1 40-mil, UV stabilized PVC coated
 - 2 Coating shall conform to NEMA RN-1
 - 3 Fittings shall be threaded.
 - 4 Conduit shall be UL-6 listed.
- B Intermediate Metal Conduit (IMC)
 - 1 Material: Steel
 - 2 Coating
 - a All uses: hot-dipped galvanized

- b Underground or corrosive areas
 - 1 40-mil, UV stabilized PVC coated
 - 2 Coating shall conform to NEMA RN-1
 - 3 Conduit shall be UL-1242 listed.
- C Electrical Metallic Tubing (EMT)
 - 1 Material: Steel
 - 2 Coating
 - a All uses: hot-dipped galvanized
 - b Underground or corrosive areas
 - 1 40-mil, UV stabilized PVC coated
 - 2 Coating shall conform to NEMA RN-1
 - 3 Fittings shall be threaded.
 - 4 Connectors and couplings
 - a Water tight, steel compression type exterior and in wet locations. Use ETP Fittings InspectorRidge or approved equal when possible.
 - b Steel set screw type in interior, dry locations.
- D Non-metallic conduit
 - 1 Conduit shall be schedule 40 PVC (minimum)
 - 2 Approved for use as non-metallic raceway with 90°C conductors
 - 3 Comply with NEMA TC-2 and NEMA TC-3
- E Flexible Metallic Conduit
 - 1 Material: High strength, hot-dipped galvanized steel
 - 2 Construction: Interlocked
 - 3 Conduits in damp, wet, or corrosive areas shall be liquid tight type with PVC jacket extruded over the steel conduit.
- F Fittings and accessories
 - 1 Fittings and accessories for all conduit types shall be approved for the purpose and equal in all respects to the conduit or raceway.
 - 2 Fittings and accessories for metallic conduits shall be made of ferrous metal and galvanized after fabrication.
- G Pull lines
 - 1 All conduits shall have a minimum of one pull line.
 - 2 Pull line shall be 1/8 inch diameter, yellow color.
 - 3 All pull lines shall be tagged at both ends so as to indicate the length of the conduit run, source, and the destination. (See section 3.3, A, 6).
 - 4 Pull lines shall be Tubbs Cordage "Polyline" or approved equal.
- H Wireways
 - 1 NEMA type
 - a NEMA-1 for dry locations
 - b NEMA-3R or NEMA-4 for damp and wet locations
 - c NEMA-4X for corrosive locations
 - 2 Metal type
 - a Non-corrosive locations: mild steel
 - b Corrosive locations: stainless steel
 - 3 Thicknesses
 - a 6"x6" cross-section and smaller: 16 gauge
 - b 8"x8" cross-section and larger: 14 gauge
 - 4 Finish: The entire enclosure shall be finished as follows:
 - a Degreasing
 - b Cleaning
 - c Phosphatizing
 - d Electrostatic deposition of polymer polyester powder coating followed by baking to produce a hard durable finish.
 - 1 The average thickness of the paint film shall be 2.0 mils.
 - 2 Paint film shall be uniform in color and free from blisters, sags, flaking and peeling

- e Finish shall conform to UL 50 and UL 50E.
 - f Color shall match surrounding area.
 - 5 Covers
 - a Wireways shall have hinged covers.
 - b NEMA 3R, 4 and 4X wireways shall be a gasket on the inside of the cover to seal the wireway when cover is closed.
 - c Covers shall have latches to secure the cover in the closed position.
 - 6 Wireways shall be UL listed.
- I Cable Trays
 - 1 Material: High strength steel
 - 2 Coating
 - a All uses: hot-dipped galvanized
 - b Underground or corrosive areas: 40-mil, UV stabilized PVC coated, coating shall conform to NEMA RN-1
 - 3 Construction
 - a Trays shall be ladder type unless otherwise noted.
 - b Maximum distance between cross-members shall be 12 inches.
 - 4 Trays shall meet NEMA VE-1 standards.
- J Raceways shall be UL listed.

2.2 WIRE AND CABLE

- A Conductors for power and lighting systems 600V or less:
 - 1 Conductors shall be 90°C rated.
 - 2 Conductors size #12 AWG and larger shall be stranded copper.
 - 3 Type:
 - a Non-residential:
 - 1 THWN for wet or underground locations
 - 2 THHN for dry locations.
 - b Residential: NM
 - c 90°C rated
 - 4 Minimum conductor size for voltage drop:
 - a Minimum size #12 AWG for runs 50 feet or less for 208/120V systems or 100 feet or less for 480/277V systems
 - b Increase conductor by one size by one method below:
 - 1 For each additional 50 feet for 208/120V systems or 100 feet for 480/277V systems.
 - 2 Calculate voltage drop and size as directed by CEC Voltage Drop Restrictions.
 - c Underground circuits shall be #8 AWG minimum wire, unless otherwise noted.
 - d Once the contractor has determined conductors' route, calculate the minimum size to meet maximum voltage drop allowed per CEC using $D_{min}=C*L*I/(V_D*N)$.
 - 1 D_{min} is the minimum diameter (circular mills)
 - 2 $C=24$ for copper, $C=39$ for aluminum
 - 3 L is conductor length (feet)
 - 4 I is the current (amps)
 - 5 V_D is the maximum allowable voltage drop (volts)
 - 6 N is the quantity of parallel conductors per phase
 - 5 Minimum size conductors for OCPD shall be determined from CEC Table 310.16 with ampacity corrected for 115°F.
 - 6 Conductor size shall be the largest size to meet maximum voltage drop (Part 3 above) and to meet CEC ampacity requirements (Part 4 above).
- B For Signal and Communication Circuits:
 - 1 Special Cables: As specified on Drawings.

- 2 Conductors for general communications use: Stranded copper conductor, #16 AWG minimum, with THWN insulation for underground or wet locations and THHN insulation for dry locations.
- 3 Ends of stranded conductors shall be tinned.

2.3 OUTLET BOXES, JUNCTION BOXES, AND PULL BOXES

- A Above ground locations
- 1 Outlet Boxes
 - a Hot-dipped galvanized after fabrication
 - b Of required size, minimum 4 inches square, for flush mounted devices and lighting fixtures
 - c Cast type with gasketed covers for outdoor or wet locations.
 - d Device and fixture back boxes shall be 2-1/4" deep, minimum.
 - 2 Junction and Pull Boxes
 - a Use outlet boxes with appropriate covers as junction boxes wherever possible.
 - b Larger junction and pull boxes
 - 1 Sheet steel, hot dipped galvanized after fabrication, finished gray baked enamel
 - 2 Sized according to code
 - 3 Screw-on covers.
- B In-ground pull boxes, handholes, and manholes
- 1 Precast concrete type with required extension collars.
 - 2 Covers
 - a Lids shall be steel or reinforced concrete, as shown on plans. Pull box lids in traffic areas or large grassy areas subject to mowing by riding mowers shall traffic rated.
 - b Covers shall include hold down bolts.
 - c Top of cover shall be flush with top of box.
 - d Covers shall be identified as ELECTRICAL, SIGNAL, or COMMUNICATIONS unless otherwise specified.
 - 3 Size boxes as indicated on Drawings. If size is not indicated on Drawings, use CEC as a minimum requirement.
 - 4 Boxes shall have 2" thick (minimum), reinforced concrete bottoms with 1" diameter drain hole over 12" of crushed rock.
 - 5 Boxes shall have approved cable supports.
 - 6 Concrete encased stubs for handholes extending five (5) feet beyond handhole.
 - 7 All pull boxes shall be no smaller than a Christy N-9.
 - 8 All pull boxes shall be set flush to finished grade and shall have an 8-inch wide by 3-inch thick concrete mow strip poured around it.
 - 9 Manufacturer shall be Brooks Products, Oldcastle Enclosure Solutions (Christy), Jensen Precast, or approved equal.
 - 10 All sections between box, extension rings, etc. and penetrations shall be sealed with mortar.
- C Floor Boxes
- 1 Provide Walker or equal Modulink non-metallic floor box for concrete areas.
 - 2 Provide quantity of boxes required to accommodate each device.
 - 3 Provide Walker Wood Floor Boxes at wood floors provide quantity required to accommodate each device.
 - 4 Provide brass flip cover lids.
- D Outlet boxes, junction boxes, pull boxes, etc. recessed in a concrete wall shall be deep masonry boxes.

2.4 CONDUIT AND EQUIPMENT SUPPORTS

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- A Conduit supports
 - 1 For Individual conduit runs not directly fastened to the structure: Rod hangers
 - 2 For multiple conduit runs: Trapeze type conduit support designed for maximum loading deflection not exceeding manufacturer's recommendations.
- B Materials
 - 1 All materials not otherwise noted:
 - a Steel with the finished part hot dipped galvanized
 - b Stainless steel for corrosive or damp environments
 - 2 All bolts and nuts shall be stainless steel.
- C Supports anchored to earth shall be anchored in a concrete base per details.
- D Manufacturers shall be Caddy, Unistrut, Powerstrut, or approved equal.
- E All exposed channels shall have end caps made by the channel manufacturer and designed for use with the channel.

2.5 WIRE CONNECTORS

- A For wire size #8 AWG and smaller: Insulated, screw type, rated 105°C, 600V for building wiring and 1000V for fixtures; Scotchlok, Ideal, or approved equal.
- B For wire size #6 AWG and larger: T&B or approved equal screw type with 3M "#33+" or Plymouth "Slipknot Gray" tape insulation.
- C Underground wire splices
 - 1 Connect ends of conductors with copper compression connectors, 3M Scotchlok or approved equal.
 - 2 Seal splice with inline resin splice kit approved for weather exposure, direct burial, and wet locations, 3M Scotchcast or approved equal.
- D Only set screw, compression type connectors may be used for MC cables. Fish hook/open tang connectors are prohibited.

2.6 GROUNDING

- A Ground Rods
 - 1 3/4 inch diameter
 - 2 Copper weld type
 - 3 10 feet in length.
- B Ground Wire: Conductors shall be medium-hard drawn, copper, and stranded, with sizes as shown on drawings.
- C Utilize CADWELD Multi-System Exothermic Welding for below grade ground connections.
- D Bolts, nuts, and washers shall be bronze, cadmium plated steel, or other corrosion resistant material approved for the purpose.

2.7 MISCELLANEOUS MATERIALS

- A All screws, bolts, nuts, and washers on equipment outdoors or in wet or corrosive environments shall be stainless steel.

2.8 SEALANTS

- A General purpose sealant: One part polysulfide or polyurethane, Federal Standard TT-S-00230c or two-part polyurethane, Federal Standard TT-SS-227E of Mameco Vulkem 116 or 227 or approved equal product manufactured by Products Research and Chemical Corporation. Pecora, Sika, Sonneborn, or Tremco may be substituted under provisions of Section 016000.
- B Conduit sealant
 - 1 Two part, self curing urethane
 - 2 Non-sagging

- 3 Liquid and gas tight
- 4 Chemically stable once cured
- 5 Compatible with conduit and conductor materials
- 6 Designed for use as conduit seal
- C Fire retardant sealant: Dow Corning Company, Type 3-6548 silicone RTV foam sealant, closed cell, 18 lb. density, 2-part system with UL certification. Type 96-081 one-part sealant shall be used for small spaces and cracks. 3M Fire Barrier Caulk CP25 is also acceptable.

2.9 IDENTIFICATION

- A Nameplates:
 - 1 White, acrylic plastic suitable for indoor or outdoor use
 - 2 Face colored as below with engraved, white, 3/16" minimum, Arial or similar font characters
 - a Equipment on normal systems: Black face
 - b Equipment on emergency systems: Red face
 - 3 Clear plastic overlay suitable for indoor or outdoor use that can be replaced if vandalized.
 - 4 Sign shall include device name, voltage, and size.
 - 5 Outdoor nameplates shall be UV stable and fade resistant.
- B Pull line identification tags:
 - 1 Aluminum plate
 - 2 1/8" tall (minimum), Arial (or similar) font, identifying text stamped on plate
 - 3 Tags shall describing conduit's length, source, and destination.

PART 3 – EXECUTION

3.1 GENERAL

- A Electric system layouts indicated on the Drawings are generally diagrammatic, but shall be followed as closely as actual construction and work of other trades will permit. Govern exact routing of cable and wiring and the locations of outlets by the structure and equipment served. Dimensions shall be taken from Architectural Drawings.
- B Consult all other Drawings. Verify scales and report any dimensional discrepancies or other conflicts to architect, or engineer if no architect is involved, before submitting bid.
- C Home runs to panelboards are indicated as starting from the outlet nearest the panel and continuing in the general direction of that panel. Continue such circuits to the panel as though the routes were completely indicated. Terminate homeruns of signal, alarm, and communications system in a similar manner.
- D Avoid cutting and boring holes through structure or structural members wherever possible. Obtain prior approval of Architect and conform to structural requirements when cutting or boring the structure is necessary or permitted.
- E Furnish and install necessary hardware, hangers, blocking, brackets, bracing, runners, required for equipment specified under this section.
- F Provide necessary backing required to insure rigid mounting of outlet boxes.
- G Install pull line in all conduits to remain that will have their conductors removed.

3.2 INSTALLATION OF CONDUIT

- A Run conduit concealed unless otherwise noted or shown on Drawings.
- B Run exposed conduit parallel to or at right angles to center lines of columns and beams.
- C Run no conduit in concrete slabs or floors except at point of penetration. Penetrations shall be at right angles to slab surfaces.

- D Install conduit above ceilings to avoid obstructing removal of ceiling tiles, lighting fixtures, air diffusers, etc.
- E Conduit shall not cross any duct shaft or area designated as future duct shaft.
Coordinated with mechanical work to avoid any conflict.
- F Install pull line in empty conduit installed under this contract. Provide and install labels as describe in "Identification" sub-section.
- G Spare conduits shall be capped to prevent intrusion of moisture and foreign objects.
- H Minimum conduit size shall be 1/2 inches when installed above ground and 3/4 inches when installed underground or under building slabs. Increase conduit size as required for wiring. Size for conduit, unless specifically shown otherwise, shall be determined from Table 3 for all conductors, Chapter 9 of latest National Electric Code.
- I Conduit shall be rigid conduit, IMC, EMT, or plastic as follows:
 - 1 Above ground and dry locations: Use rigid conduit, IMC or EMT.
 - a Wet locations: Rigid conduit, IMC.
 - b Locations subject to mechanical injury: Rigid conduit or IMC only.
 - c In concrete walls or block walls: Rigid steel conduit or IMC only.
 - d Dry locations and not subject to mechanical injury: EMT (interior locations only), IMC, or rigid conduit.
 - 2 Underground: Use wrapped rigid steel or plastic.
 - a Schedule 40 PVC: For use underground where protected by concrete slabs, asphaltic pavement, or concrete walkways. Use steel elbows for plastic conduit runs penetrating floor slabs. Bends in plastic conduit other than normal long sweeps shall be made only with factory formed ells or curved segments. Heat bending may not be used. Sections of rigid steel conduit runs are require where direction changes. In all cases where use of plastic conduit is allowed or specified, Contractor may, at his option, use rigid steel conduit.
 - b Underground conduits shall have red 4" wide identifying caution tape reading "CAUTION ELECTRICAL LINE BELOW", length as required and installed 12" above all conduits runs.
 - c Do not install plastic conduit in rock base.
 - d Underground conduit entering building shall be provided with one (1) 10 foot section of rigid steel conduit at point of penetration of foundation, footing or basement wall, with approximately equal lengths inside and outside building line, unless otherwise noted.
 - 3 Bends
 - a Make risers to grade with rigid steel long radius sweep conduit and rigid steel elbow fittings only.
 - b Minimum radius of sweeps shall be 24 inches.
- J Burial depth of conduit shall be as follows:
 - 1 Concrete encased: 24 inch minimum for 600V or lower systems to top of concrete encasement.
 - 2 Conduit without concrete encasement or cap: 24 inch minimum to top of conduit.
 - 3 When installed under buildings, the above minimum depth shall be 18 inches below bottom of floor slab.
- K Use flexible steel conduit in the following applications:
 - 1 Recessed lighting fixtures.
 - 2 Motor connections.
 - 3 Connection between fan plenum and structure.
 - 4 At expansion joints.
 - 5 At transformers and other equipment which produce vibration.
- L Provide junction boxes/pull boxes as required to limit any power system conduit run to a maximum of four (4) 90 degree bends (two (2) 90 degree bends for signal communication system conduit runs) or to avoid "U" bends.
- M Conduit Supports:

- 1 Support conduit with Underwriters' Laboratories listed conduit support intervals required by the California Electric Code.
 - 2 Wire or sheet metal strips are not acceptable for conduit not directly fastened to structure or for multiple conduit runs.
 - 3 Individual conduit 1/2 inch and 3/4 inch size may be supported from ceiling support wire with Caddy clips only if acceptable to local code. Only one conduit is permitted to be attached to any ceiling support wire. Hang such conduit so as not to affect level of ceiling.
 - 4 Avoid attaching conduit to fan plenums. When it is necessary to support conduit from fan plenum, provide a length of flexible conduit between the section attached to the fan plenum and other sections. Provide a length of flexible conduit between the portion attached to the building to minimize transmission of vibration to the building structure.
- N Conduit penetration of roof, walls, floors and ceilings shall be sealed to preserve the integrity of waterproofing, fire rating and soundproofing for which the roof, wall, floor or ceiling is designed. Materials and methods used shall conform to that specified under Architectural sections.
- O Underground conduit and ducts 2 inches and larger shall be proven clear by pulling through a mandrel 1/4 inch smaller than the inside diameter.
- P Where flush branch circuit panelboards or terminal cabinets are shown on walls, stub a minimum of four (4) 1 inch empty conduit into overhead ceiling spaces and four (4) 1 inch empty conduit into space below floor (if any) in addition to conduit required for circuit wiring.
- Q Paint all exposed conduit to match its surroundings.
- R Plastic conduits exposed to sun light shall be UV stabilized.
- S Where rigid steel conduit runs in direct contact with the earth, conduit shall be wrapped with 10-mil PVC tape to form 40 mil of protection, or shall have factory applied PVC coating.
- T Label all conduits at each terminus, pull box, and junction box.

3.3 INSTALLATION OF WIRE

- A Install all wiring in raceway unless specifically shown or noted otherwise.
- B Pull no wire into any portion of the conduit system until construction work which may damage the wire has been completed.
- C Install wire continuous from outlet to outlet or terminal to terminal. Splices in cables when required shall be made in handholes, pull boxes or junction boxes. Make branch circuit splices in outlet boxes with 8 inches of correctly color-coded tails left in the box.
- D Make splices in wires and cables utilizing specified materials and methods.
- E Cables and wires passing through handholes shall be full looped inside the handhole (360 degree) and supported on galvanized steel racks, beginning 10" above the bottom of the handhole. Leave handhole in clean condition with debris removed.
- F Make ground, neutral, and line connections to receptacle and wiring device terminals as recommended by manufacturer. Provide ground jumper from outlet box to ground terminal of devices when the device is not approved for grounding through the mounting screws.
- G Provide Brady wire markers where number of conductors in a box exceed four (4).
- H Wiring shall be tested for continuity (600V and below). All systems shall be entirely free from grounds, short circuits, and any or all defects.
- I Measure and record the insulation resistance of 600 volt insulated conductors size #4/0 AWG and larger using a 500 volt megger for one minute. Make tests with circuits isolated from source and load.
- J All conductor bends must have a radius greater than or equal to the manufacturer's listed bending radius.
- K Label all conductors at each terminus, pull box, and junction box.

3.4 WIRE COLOR CODE

- A Color code conductors. Wire sized #8 AWG and smaller shall have integral color coded insulation. Wire sizes #6 AWG and larger may have black insulation but shall be identified by color coded electrical tape at junction, splice, pull and termination points. Apply color tape with 1/2 lap to at least 6 inches of the conductor.
- B Color code wire as follows:
- | | | |
|------------|----------|--|
| Conductors | 208/120V | 480/277V |
| Phase A | Black | Brown |
| Phase B | Red | Orange |
| Phase C | Blue | Yellow |
| Neutral | White | White or Gray (consistent throughout facility) |
| Ground | Green | Green |

3.5 CONNECTIONS TO EQUIPMENT

- A General:
- 1 Furnish and install required power supply conduit and wiring to equipment. See below for other wiring required.
 - 2 Furnish and install a disconnect switch immediately ahead of and adjacent to each magnetic motor starter or appliance unless the motor or appliance is located adjacent to and within sight of the serving panelboard, circuit breaker or switch. Verify equipment nameplate current ratings prior to installation.
 - 3 Mount motor starters including those furnished under other sections or specifications, and provide power wiring to them.
 - 4 Install rough-in work for equipment from approved shop drawings to suit the specific requirements of the equipment.
 - 5 Furnish and install magnetic motor starters that are shown on the Drawings or specified under other divisions to be furnished under this division of work. Verify equipment nameplate ratings prior to installation and furnish adequately rated starters for the loads.
 - 6 Furnish and install manual thermal protection for motors not integrally equipped with thermal protection.
 - 7 Furnish and install 120V power to each control panel and time switch requiring a source of power to operate.
- B Heating, ventilating, and air conditioning equipment:
- 1 Coordinate with mechanical contractor for sizes, locations and details of motors, heating units, and control requirements.
 - 2 Provide required power supply conduit and wiring to equipment.
 - 3 Provide a suitable means of disconnect switch immediately ahead of and adjacent to each motor and appliance unless the motor or appliance is located adjacent and within sight of the service panelboard, circuit breaker or switch at a distance allowed by codes. Verify equipment nameplate current ratings prior to installation. Provide a disconnect means at each magnetic motor starter.
 - 4 Provide magnetic motor starters required under this division of work.
 - 5 Provide manual thermal protection for motors not integrally equipped with thermal protection.
 - 6 Line and low voltage temperature control and interlock wiring, conduit, and required connections are a part of other divisions unless specifically shown or noted on the Drawings as to be furnished under this section.
 - 7 Provide 120V power supply to control panels, time switch furnished and installed under other divisions of work.
 - 8 Furnish and install 120V power to each duct detector scheduled for operation of fire dampers or shut down of mechanical equipment. Coordinate the exact quantity and locations with the mechanical drawings.
- C Plumbing and other contractor-furnished and Owner-furnished equipment:

- 1 Required power and control conduit, wiring and connections are included under this section of the work. Control sensing and alarm devices will be furnished under the respective section of the contract supplying the equipment unless noted otherwise. These devices will be located in pipes, ducts, vessels, tanks, etc., and will be mounted in a place by the Contractor furnishing the devices. Other devices shall be mounted under this section of the work.
- 2 Control panels for packaged equipment will be furnished under the respective section of the contract supplying the equipment unless otherwise noted. Installation and connection of the control panels are under this section of the work.

3.6 SYSTEM NEUTRAL GROUND

- A Ground the neutral conductor of each transformer to limit the maximum potential above ground due to normal operating voltage and limit the voltage level due to abnormal conditions.
- B Ground transformers with secondary voltage 600V class or less as follows: 3 phase, 4 wire wye connected: ground neutral point.
- C For transformers 75kVA size or lower with primary voltage 480V or lower, the primary equipment ground conductor may be used for grounding the secondary neutral provided it is adequately sized in accordance with CEC system ground conductor size.

3.7 EQUIPMENT GROUND

- A Ground non-current carrying metal parts of electrical equipment enclosures, frames, or conductor raceways to provide a low impedance path for line to ground fault current and to bond all non current carrying metal parts together. Install a ground conductor in each raceway system. Equipment ground conductor shall be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per CEC 250.95 unless otherwise shown on drawings.
- B Grounding conductors shall be identified with green insulation. Where green insulation is not available, on larger sizes, black insulation shall be used and suitably identified with green tape at each junction box or enclosure device.
- C Install metal raceway couplings, fittings and terminations secure and tight to insure good ground continuity. Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure and at concentric knockouts.
- D Lighting fixtures shall be securely connected to equipment ground conductors. Outdoor lighting standards shall have a factory installed ground for terminating the ground wire.
- E Motors shall be connected to equipment ground conductors with a conduit grounding bushing and with a bolted solderless lug connection on the metal frame.

3.8 STRUCTURAL GROUND

- A Concrete encased electrode shall be 2 inches above the bottom of concrete footing where shown on drawings. See drawings for details.
- B Domestic, chilled and hot water mains and fire protection metallic water pipes shall be connected to the ground bus with #4/0 AWG bare copper conductor at a minimum of two points.
- C Miscellaneous metal objects including piping, vessels and structural shapes within six feet of metallic objects connected to the ground system and which are not interconnected mechanically with the grounding system, shall be interconnected with a minimum #6 AWG bare copper conductor.

3.9 IDENTIFICATION

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- A Provide and install nameplates on all switchboards, distribution boards, panels, motor starters, VFDs, transformers, safety switches/disconnects, push buttons, selector switches, pilot lights, and other similar devices. Fasten nameplates to equipment with one sheet metal screw at each corner.
- B Provide and install labels on lighting switches and convenience and special purpose receptacles to show panel and circuit number to which the device is connected.
- C Provide and install identification tags on all conduit pull.
- D Provide label meeting ANSI Z535 standards on motors reading:
WARNING
AUTOMATIC EQUIPMENT
MAY START AT ANY TIME

3.10 CIRCUIT BREAKER ELECTRICAL COORDINATION STUDY

- A If required, contractor shall provide a coordination study to determine trip settings of circuit breakers.
- B Contractor may elect to have the engineer of record provide such services at the contractor's expense.

3.11 ARC FLASH STUDY

- A If required, contractor shall provide a study to determine potential arc flash energy.
- B Contractor may elect to have the engineer of record provide such services at the contractor's expense.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

Materials, equipment fabrication, installation and tests in conformity with equipment applicable to this project, applicable codes and authorities having jurisdiction, for grounding

1.2 RELATED SECTIONS

- A General requirements specifically applicable to Division 16, in addition to Division 16, in addition to Division 1 provision.
- B Related Sections Under Division 16:
 - 1 Section 16000 – Electrical
 - 2 Section 16050 – Basic Materials and Methods.
 - 3 Section 16080 – Electrical Testing
 - 4 Section 16400 – Low Voltage Distribution.

1.3 REFERENCE STANDARDS

Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 16000.

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Supply equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.

1.5 SUBMITTALS

- A Submit under provisions of Section 01330. Provide detailed description of items supplied, including specifications, performance characteristics, materials, wiring diagrams and schedules.
 - 1 Submit evidence that products satisfy seismic requirements for the State of California.
 - 2 Submit evidence of compliance with the applicable standards listed under Article 1.3 of this section.
- B Manufacturer's Instructions: Submit manufacturer's installation instructions.
- C Product Data: Submit manufacturer's descriptive literature.
- D Shop Drawings: Submit complete fabrication details, elevations and sections of switchboard, dimensions, space available for conduit, rating, short circuit withstand ability of bus and lowest rated device, circuit schedule showing circuit number, device description, device frame ampere rating and trip, fuse clip ampere rating, termination lug size, feeder and circuit identification, conductor ratings and one-line and wiring diagrams. Include both elementary diagram and terminal to terminal wiring diagrams.
- E Substitutions: Items of same function and performance shall be in conformance with Division 1.
- F Submit field test and operations check report for circuit breakers and motor starters under provisions of Section 16080.

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1.6 OPERATION AND MAINTENANCE DATA

- A Submit operation instructions, maintenance and repair data under provisions of Division 1.
- B Ship equipment in its original packages to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- C Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- D Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

PART 2 - PRODUCTS

2.1 GROUND RODS

Ground rods shall be:

- A. 3/4 inch diameter
- B. Copper weld type
- C. 10 feet in length.

2.2 BARE COPPER GROUND WIRE

Conductors shall be medium-hard drawn, copper, and stranded, with sizes as shown on drawings.

2.3 BELOW GRADE GROUND CONNECTIONS

Utilize CADWELD Multi-System Exothermic Welding.

2.4 HARDWARE

Bolts, nuts and washers shall be bronze, cadmium plated steel, or other non-corrosive material, approved for the purpose.

PART 3 - EXECUTION

3.1 SYSTEM NEUTRAL GROUND

- A Ground the neutral conductor of each transformer to limit the maximum potential above ground due to normal operating voltage and limit the voltage level due to abnormal conditions.
- B Ground transformers with secondary voltage 600V class or less as follows: 3-phase, 4-wire wye connected: ground neutral point.
- C For transformers 75kVA size or lower with primary voltage 480V or lower, the primary equipment ground conductor may be used for grounding the secondary neutral provided it is adequately sized in accordance with CEC system ground conductor size.

3.2 EQUIPMENT GROUND

- A Ground non-current carrying metal parts of electrical equipment enclosures, frames, or conductor raceways to provide a low impedance path for line-to-ground fault current and to bond all non-current carrying metal parts together. Install a ground conductor in each raceway system. Equipment ground conductor shall be electrically and mechanically

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- continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per CEC 250-95 unless otherwise shown on drawings.
- B Grounding conductors shall be identified with green insulation. Where green insulation is not available, on larger sizes, black insulation shall be used and suitably identified with green tape at each junction box or enclosure device.
 - C Install metal raceway couplings, fittings and terminations secure and tight to insure good ground continuity. Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure and at concentric knockouts.
 - D Lighting fixtures shall be securely connected to equipment ground conductors. Outdoor lighting standards shall have a factory installed ground for terminating the ground wire.
 - E Motors shall be connected to equipment ground conductors with a conduit grounding bushing and with a bolted solderless lug connection on the metal frame.

3.3 STRUCTURAL GROUND

- A Concrete encased electrode shall be 2 inches above the bottom of concrete footing where shown on drawings. See drawings for details.
- B Domestic, chilled and hot water mains and fire protection metallic water pipes shall be connected to the ground bus with #4/0 AWG bare copper conductor at a minimum of two points.
- C Miscellaneous metal objects including piping, vessels and structural shapes within six feet of metallic objects connected to the ground system and which are not interconnected mechanically with the grounding system, shall be interconnected with a minimum #6 AWG bare copper conductor.

3.4 CIRCUIT BREAKER ELECTRICAL COORDINATION STUDY

- A If required, contractor shall provide a coordination study to determine trip settings of circuit breakers.
- B Contractor may elect to have the engineer of record provide such services at the contractor's expense.

3.5 GROUND RESISTANCE TEST

- A Building ground electrode resistance testing shall be accomplished with a ground resistance, direct reading, single test meter utilizing the Fall-of-Potential method and two (2) referenced electrodes. Perform test prior to interconnection to other grounding system. Orient the concrete encased ground electrode to be tested and the two referenced electrodes in straight line spaces fifty (50) feet apart. Drive the two (2) reference electrodes ten (10) feet deep.
- B Test results shall be in writing, and shall show temperature, humidity and condition of the soil at the time of the tests. In the case where the ground resistance exceeds 25 ohms, add an additional ground rod and retest. Add additional ground rods when necessary in order to bring the ground resistance below 25 Ohms. All testing shall be done prior to concrete pour and in the presence of the inspector of record. Provide test results for engineer review.

END OF SECTION

SECTION 260800 – COMMISSIONING OF ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A Testing in conformity with equipment applicable to this project, applicable codes and authorities having jurisdiction
- B Test equipment requirements listed in this section shall apply to testing required by all other sections in Division 26, Division 27, and Division 28.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.
- B California Electrical Code
- C International Electrical Testing Association (NETA)
 - 1 NETA ATS: for Acceptance Testing Specifications for Electrical Power Equipment and Systems
- D Institute of Electrical and Electronic Engineers
 - 1 IEEE 81: Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System Part 1: Normal Measurements
 - 2 IEEE 82: Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors
 - 3 IEEE 95: Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors
 - 4 IEEE 112: Standard Test Procedure for Polyphase Induction Motors and Generators
 - 5 IEEE 114: Standard Test Procedure for Single-Phase Induction Motors
 - 6 IEEE 115: IEEE Guide for Test Procedures for Synchronous Machines Part I—Acceptance and Performance Testing Part II—Test Procedures and Parameter Determination for Dynamic Analysis
 - 7 IEEE 141: Recommended Practice for Electric Power Distribution for Industrial Plants
 - 8 IEEE 142: Recommended Practice for Grounding of Industrial and Commercial Power Systems
 - 9 IEEE 241: Recommended Practice for Electric Power Systems in Commercial Buildings
 - 10 IEEE 242: Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems (IEEE Buff Book)

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- 11 IEEE 252: Standard Test Procedure for Polyphase Induction Motors Having Liquid in the Magnetic Gap
- 12 IEEE 259: Standard Test Procedure for Evaluation of Systems of Insulation for Dry-Type Specialty and General-Purpose Transformers
- 13 IEEE 389: Recommended Practice for Testing Electronics Transformers and Inductors
- 14 IEEE 393: Test Procedures for Magnetic Cores
- 15 IEEE 399: Recommended Practice for Industrial and Commercial Power Systems Analysis (Brown Book)
- 16 IEEE 400: Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable Systems Rated 5 kV and Above
- 17 IEEE 442: Guide for Soil Thermal Resistivity Measurements
- 18 IEEE 495: Guide for Testing Faulted Circuit Indicators
- 19 IEEE 576: Recommended Practice for Installation, Termination, and Testing of Insulated Power Cable as Used in Industrial and Commercial Applications
- 20 IEEE 1188: Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications
- 21 IEEE 1234: Guide for Fault Locating Techniques on Shielded Power Cable Systems
- 22 IEEE 1415: Guide for Induction Machinery Maintenance Testing and Failure Analysis
- 23 IEEE 1458: Recommended Practice for the Selection, Field Testing, and Life Expectancy of Molded Case Circuit Breakers for Industrial Applications
- E National Institute of Standards and Technology (NIST)
- F Underwriters' Laboratories
 - 1 UL 1244: Electrical and Electronic Measuring and Testing Equipment
 - 2 UL 1436: Outlet Circuit Testers and Similar Indicating Devices
 - 3 UL 61010-2-030: Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits
 - 4 UL 61010B-1: Electrical Measuring and Test Equipment – Part 1: General Requirements
 - 5 UL 61010B-2-031: Electrical Equipment for Measurement, Control, and Laboratory Use – Part 2: Particular Requirements for Hand-Held Probe Assemblies for Electrical Measurement and Test
 - 6 UL 61010B-2-032: Electrical Equipment for Measurement, Control, and Laboratory Use – Part 2: Particular Requirements for Hand-Held Current Clamps for Electrical Measurement and Test

1.4 QUALITY ASSURANCE

- A The Contractor shall engage and pay for the services of a recognized independent testing laboratory for the purpose of performing inspections and tests as herein specified.
- B The testing laboratory shall provide all material, equipment, labor and technical supervision to perform switch tests and inspections.
- C It is the intent of these tests to assure that all electrical equipment, both Contractor and Owner supplied, is operational within industry and manufacturer's tolerances and is installed in accordance with design specifications.
- D The tests and inspections shall determine the suitability for energizing.
- E Schedule tests and give a minimum of two weeks advance notice to the Owner.

1.5 SUBMITTALS

- A List of tests performed
- B Test procedures
- C Test results

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- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.

1.6 QUALIFICATIONS OF TESTING AGENCY

The testing agency shall meet federal OSHA criteria for accreditation of testing laboratories, Standard Number 1910.7 (Definition and Requirements for a nationally recognized testing laboratory). International Electrical Testing Association (NETA) accreditation constitutes proof of meeting such criteria.

1.7 TEST INSTRUMENT TRACEABILITY

- A The testing laboratory shall have a calibration program which maintains all applicable test instrumentation within rated accuracy.
- B The accuracy shall be traceable to the National Institute of Standards and Technology (NIST) in an unbroken chain.
- C Instruments shall be calibrated in accordance with the following frequency schedule:
 - 1 Field instruments: 6 months maximum.
 - 2 Laboratory instruments: 12 months.
 - 3 Leased specialty equipment: 12 months
- D Dated calibration labels shall be visible on all test equipment.

1.8 FINAL SETTINGS

- A The test report shall include the following: summary of project, description of equipment tested, description of test, list of test equipment used in calibration and calibration date, test results, conclusions and recommendations, and appendix, including appropriate test forms.
- B The test report shall be bound and its contents certified.
- C Submit three copies of the completed report to the architect, or engineer if no architect is involved, no later than fifteen (15) days after completion of test, unless otherwise directed.

1.9 FAILURE TO TEST

- A Any system material or workmanship which is found defective on the basis of acceptance tests shall be reported directly to the architect or engineer if no architect is involved.
- B Contractor shall replace the defective material or equipment and have test repeated until test proves satisfactory without additional cost to the Owner.

PART 2 – PRODUCTS: [NOT USED]

PART 3 – EXECUTION

3.1 GROUND RESISTANCE TEST

- A Building ground electrode resistance testing shall be accomplished with a ground resistance, direct-reading, single test meter utilizing the Fall-of-Potential method and two (2) referenced electrodes. Perform test prior to interconnection to other grounding system. Orient the concrete-encased ground electrode to be tested and the two referenced electrodes in straight line spaces fifty (50) feet apart. Drive the two (2) reference electrodes ten (10) feet deep.
- B Test results shall be in writing, and shall show temperature, humidity and condition of the soil at the time of the tests. In the case where the ground resistance exceeds 25 ohms, add an additional ground rod and retest. Add additional ground rods when necessary in order to

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bring the ground resistance below 25 Ohms. All testing shall be done prior to concrete pour and in the presence of the inspector of record. Provide test results for engineer review.

3.2 MISCELLANEOUS TESTING

- A Functional and operational testing to the fire alarm, security system, telephone system, paging/intercom system, and all electrical components upon completion of electrical work.
- B Perform an insulation resistance test on all switchboard busses, bus ducts; feeder conductors, including neutrals, using a megohmmeter. Minimum value for each conductor shall be 20 megohms.

3.3 ELECTRICAL DISTRIBUTION EQUIPMENT OPERATIONAL CHECK

- A Electrical distribution equipment operational check includes main switchboards, distribution boards, panelboards, panels, switchgear, etc.
- B Verify proper operating condition of all equipment mechanically and electrically including, but not limited to verifying operation of each circuit breaker trip device with a rating of 100A or more using an accurately metered timed instrument (by passing 300% rated current through each pole).
- C If any equipment is found defective during operational check, it shall be replaced by the Contractor without cost to the Owner. The tests shall be repeated by the Contractor without cost to the owner until satisfactory results are obtained.

END OF SECTION

SECTION 26 24 16 – PANELBOARDS

PART 1 – GENERAL

1.1 SECTION INCLUDES

Lighting and Appliance Panelboards

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.
- B California Electrical Code
- C California Building Code
- D Institute of Electrical and Electronic Engineers (IEEE)
 - 1 IEEE 81: Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
 - 2 IEEE 100: The Authoritative Dictionary of IEEE Standards Terms
 - 3 IEEE C2 National Electrical Safety Code
 - 4 IEEE C12.16: Solid-State Electricity Meters
 - 5 IEEE C37.13: Standard for Low-Voltage AC Power Circuit Breakers Used in Enclosures
 - 6 IEEE C37.20.1: Standard for Metal-Enclosed Low-Voltage Power Circuit-Breaker Switchgear
 - 7 IEEE C37.90.1: Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus
 - 8 IEEE C57.12.28: Standard for Pad-Mounted Equipment - Enclosure Integrity
 - 9 IEEE C57.12.29: Standard for Pad-Mounted Equipment - Enclosure Integrity for Coastal Environments
 - 10 IEEE C57.13: Standard Requirements for Instrument Transformers
- E National Electrical Manufacturers' Association
 - 1 NEMA 250: Enclosures for Electrical Equipment (1000 Volts Maximum)
 - 2 NEMA PB 2: Deadfront Distribution Switchboards
 - 3 NEMA PB 2.1: General Instructions for Proper Handling, Installation, Operation and Maintenance of Deadfront Distribution Switchboards Rated 600 V or Less
 - 4 NEMA ST 20: Standard for Dry-Type Transformers for General Applications
 - 5 NEMA 12.10: Physical Aspects of Watthour Meters - Safety Standards
- F National Electrical Testing Association (NETA)
 - 1 NETA ATS: Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems
- G Underwriters' Laboratories (UL)

- 1 UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
- 2 UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
- 3 UL 467: Grounding and Bonding Equipment
- 4 UL 486A: Wire Connectors
- 5 UL 486B: Wire Connectors
- 6 UL 486E: Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
- 7 UL 489: Molded Case Circuit Breakers, Molded Case Switches, and Circuit Breaker Enclosures
- 8 UL 891: Switchboards
- 9 UL 1053: Ground-fault Sensing and Relaying Equipment
- 10 UL 1059: Terminal Blocks
- 11 UL 1558: Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear
- 12 UL 2062: Enclosures for Use in Hazardous (Classified) Locations
- 13 UL 2735: Electric Utility Meters
- 14 UL 60947-1: Low-Voltage Switchgear and Controlgear – Part 1: General Rules
- 15 UL 60947-7-1: Low-voltage switchgear and controlgear – Part 7-1: Ancillary equipment - Terminal blocks for copper conductors
- 16 UL 60947-7-2: Low-Voltage Switchgear and Controlgear - Part 7-2: Ancillary Equipment - Protective Conductor Terminal Blocks for Copper Conductors

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Supply equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Ship equipment in its original packages to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- F Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- G Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 Calibration procedures and intervals
- C Submit shop drawings that include:
 - 1 Complete fabrication details
 - 2 Elevations and sections of enclosure(s)
 - 3 Dimensions of enclosure(s)
 - 4 Space available for conduits
 - 5 Voltage, ampacity, short circuit, and enclosure ratings

- 6 Short circuit withstand ability of bus and lowest rated device,
- 7 Circuit schedule showing circuit number, device description, circuit breaker frame ampere rating and trip or fuse clip ampere rating
- 8 Termination lug size
- 9 Feeder identification
- 10 Single line diagram
- 11 Include both elementary diagram and terminal to terminal wiring diagrams.
- D Electronic submittals shall be searchable
- E The submittal shall be substantially complete for all items and equipment furnished under this section.
- F Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- G Substitutions: Items of same function and performance shall be in conformance with Division 1. The Contractor shall provide a comparison of the proposed substitute with the specified equipment for review by the Engineer.
- H Submit field test and operations check report for circuit breakers under provisions of Section 260500.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Manufacturer's data sheets – When data sheets include more than one model the model(s) used shall be noted
 - 4 Manufacturer's user and maintenance manual(s), including trouble-shooting guidelines
 - 5 Configuration settings
 - 6 Wiring diagrams
 - 7 Voltage ratings
 - 8 Current ratings
 - 9 List of capabilities
 - 10 Environmental ratings
 - 11 NEMA enclosure type
 - 12 Maintenance requirements
 - 13 Installation instructions
 - 14 Repair instructions
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A Square D Company
 - 1 I-LINE - CLASS 2110
 - 2 NQOD - CLASS 1630
 - 3 NF - Class 1670
- B Equals
 - 1 General Electric
 - 2 Eaton/Cutler-Hammer
 - 3 Approved equal

- C Panelboards serving critical infrastructure (hospitals, utilities, public safety, etc.) shall be seismically certified by OSHPD.

2.2 TYPE NQOD PANELBOARD

- A Interior
 - 1 Shall be type NQOD panelboard or approved equal rated for 240V_{AC}/48V_{DC} maximum. Continuous main current ratings, as indicated on associated schedules, not to exceed 600 amperes maximum.
 - 2 Minimum short circuit current rating: 22000AIC as indicated in rms symmetrical amperes at 240V_{AC}.
 - 3 Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67. Bussing rated 100-400 amperes shall be copper. Bussing shall be copper as standard construction.
 - 4 Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed twistouts covering unused mounting space.
- B Main Circuit Breaker
 - 1 Main circuit breakers shall have an over-center, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40°C ambient environment. Thermal elements shall be ambient compensating above 40°C.
 - 2 Two- and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker which allows the user to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.
 - 3 Breaker handle and faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL Listed for reverse connection without restrictive line or load markings.
 - 4 Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors 90°C rated wire, sized according to the 75°C temperature rating per CEC Table 310-16.
- C Enclosures
 - 1 Type 1 Boxes
 - a Boxes shall be galvanized steel constructed in accordance with UL 50 requirements.
 - b Boxes shall have removable end walls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.
 - c Box width shall be 20 in wide.
 - 2 Type 1 Fronts
 - a Front shall meet strength and rigidity requirements per UL 50 standards.
 - b Front shall have cylindrical tumbler type lock with catch and spring-loaded stainless steel door pull. All lock assemblies shall be keyed alike. Two (2) keys shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
 - c All electrical busses shall be copper.
 - 3 Type 3R, 5, and 12
 - a Enclosures shall be constructed in accordance with UL 50 requirements

- b All doors shall be gasketed and equipped with a tumbler type vault lock. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
- c Maximum enclosure dimensions shall not exceed 20 in wide and 6.5 in deep.

2.3 TYPE NF PANELBOARD

- A Interior
 - 1 Shall be type NF panelboard for 480Y/277V_{AC} maximum. Continuous main current ratings, as indicated on associated schedules, not to exceed 600 amperes maximum.
 - 2 Minimum Short Circuit Rating: 14000 as indicated rms symmetrical amperes at 480Y/277V_{AC}.
 - 3 Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors limited to bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67. Bussing rated 100-400 amperes shall be copper. Bussing rated for 600 amperes shall be copper as standard construction.
 - 4 Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed twistouts covering unused mounting space.
- B Main Circuit Breaker
 - 1 Main circuit breakers shall have an over-center, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40°C ambient environment. Thermal elements shall be ambient compensating above 40°C.
 - 2 Two- and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the breaker which allows the user to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.
 - 3 Circuit breaker handle and faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL Listed for reverse connection without restrictive line or load markings.
 - 4 Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 90°C rated wire, sized according to the 75°C temperature rating per CEC Table 310-16.
- C Enclosures
 - 1 Type 1 Boxes
 - a Boxes shall be galvanized steel constructed in accordance with UL 50 requirements.
 - b Boxes shall have removable end walls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.
 - 2 Type 1 Fronts
 - a Front shall meet strength and rigidity requirements per UL 50 standards.
 - b Front shall have flat latch type lock with catch and spring loaded stainless steel door pull. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
 - 3 Type 3R, 5, and 12

- a Enclosures shall be constructed in accordance with UL 50 requirements
- b All doors shall be gasketed and equipped with a tumbler type vault lock and two (2) additional trunk type latches. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
- c Maximum enclosure dimensions shall not exceed 21 inches wide and 8 inches deep.

2.4 ENCLOSURE FINISH

- A The completed enclosure shall be degreased and cleaned.
- B After the cleaning process is finished, the enclosure shall be phosphatized.
- C After the phosphatizing, the enclosure shall receive an electrostatic deposition of polyester powder coating followed by baking to produce a hard durable finish.
 - 1 The minimum thickness of the paint film shall be 2.0 mils.
 - 2 For the exterior of transformer tank, interior and exterior of primary and secondary cable compartments the minimum total dry film thickness shall be 3.5 mils.
 - 3 Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
- D Finish shall conform to UL 50 and UL 50E.
- E Color shall be ANSI 61 Gray.
- F Coat underside surfaces of equipment outdoors or in damp locations with a corrosion resistant coating.

2.5 NAMEPLATES

Provide and install nameplates per Section 260500.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install all equipment per manufacturers' instructions.
- B. Test all equipment per manufacturer's instructions.
- C. Mount panelboards with center of top circuit breaker handle no higher than 78" above finished floor. Install flush mounted panelboards as indicated on architectural interior elevation drawings. Provide all necessary blocking, channels and other hardware for securing panelboards to wall, column or other parts of building structure.
- D. Submit three copies of the certified list for permanent record to be referenced to in the event of failure of any motor either within or beyond expiration of the warranty period.

3.2 GROUNDING

- A. Ground equipment per manufacturer's instructions, Section 260500, and applicable codes.
- B. Minimize resistance from device to ground.
- C. Resistance from device to ground shall not exceed 25 ohms.

3.3 LOAD BALANCING

If the contractor changes circuiting from the panel schedule on the approved plans, the contractor shall be responsible to ensure that the loads on any two phases differ by no more than 5%.

3.4 IDENTIFICATION

- A Provide nameplate identifying panel on exterior of panel per requirements in Section 260500.
- B Provide type written panel schedule on interior of door.

END OF SECTION

SECTION 262700 – LOW VOLTAGE (0-600V) DISTRIBUTION EQUIPMENT

PART 1 – GENERAL

1.1 SECTION INCLUDES

Materials, equipment fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction, for the following:

- A Wiring devices
- B Terminal cabinets
- C Power distribution terminal blocks

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS

Published specification standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.

- A California Building Code
- B California Electrical Code
- C Underwriters' Laboratories
 - 1 UL 20: General Use Snap Switches
 - 2 UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 3 UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 4 UL 111: Multi-Outlet Assemblies
 - 5 UL 231: Power Outlets
 - 6 UL 486A: Wire Connectors
 - 7 UL 486B: Wire Connectors
 - 8 UL 486E: Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
 - 9 UL 498: Attachment Plugs and Receptacles
 - 10 UL 514A: Metallic Outlet Boxes
 - 11 UL 514C: Nonmetallic Outlet Boxes, Flush-device Boxes, and Covers
 - 12 UL 514D: Cover Plates for Flush-mounted Wiring Devices
 - 13 UL 917: Clock Operated Switches
 - 14 UL 943: Ground Fault Circuit Interrupters
 - 15 UL 1010: Receptacle Plug Combinations for Use in Hazardous (Classified) Locations
 - 16 UL 1681: Wiring Devices Configurations
 - 17 UL 1682: Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type
 - 18 UL 1773: Standard for Termination Boxes
 - 19 UL 1801: Power Distribution Centers for Communications Equipment
 - 20 UL 1953: Power Distribution Terminal Blocks

- 21 UL 2255: Standard for Receptacle Closures
- 22 UL 2682: Switch Rated Plugs and Receptacles

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Deliver, store and protect products under provisions of Section 016200.
- F Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- G Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- H Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 Calibration procedures and intervals
 - 7 A complete set of drawings for any special items
 - 8 A single line block diagram showing exactly the manner in which the contractor proposes to layout the system.
 - 9 Wiring diagrams
 - 10 Illustrations and scale drawing of the racks, equipment layouts etc.
 - 11 Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
 - 12 The contractor shall also submit a copy of his valid state contractor's license and show proof that he is a distributor of the submitted equipment.
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number

- 3 Manufacturer's data sheets – When data sheets include more than one model the model(s) used shall be noted
- 4 Manufacturer's user and maintenance manual(s), including trouble-shooting guidelines
- 5 Configuration settings
- 6 Wiring diagrams
- 7 Voltage ratings
- 8 Current ratings
- 9 List of capabilities
- 10 Environmental ratings
- 11 NEMA enclosure type
- 12 Maintenance requirements
- 13 Installation instructions
- 14 Repair instructions
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 WIRING DEVICES

- A Wall (Local) Switches
 - 1 Totally enclosed
 - 2 AC rated
 - 3 20A rated
 - 4 Silent type, unless noted otherwise on the plans
 - 5 Manufacturers
 - a Hubbell Premise Wiring
 - b Leviton
 - 6 Grade
 - a Medical facilities: Hospital Grade
 - b Commercial facilities: Specification Grade
 - c Educational facilities: Heavy Duty Specification Grade
 - d Industrial facilities: Industrial Grade or Extra Heavy Duty Specification Grade
- B Receptacles
 - 1 Duplex receptacles shall be 20A, 125V_{AC} rated, 3-wire, grounded
 - 2 Receptacle shall include a LED that indicates it has power.
 - 3 Receptacles shall be tamperproof.
 - 4 Manufacturers
 - a Hubbell Premise Wiring
 - b Leviton
 - 5 Grade
 - a Commercial facilities: Specification Grade
 - b Educational facilities: Heavy Duty Specification Grade
 - c Industrial facilities: Industrial Grade or Extra Heavy Duty Specification Grade
 - d Medical facilities: Hospital Grade
 - e Residential: Residential Grade
 - 6 Exterior receptacle plates shall have steel, weatherproof, vandal-resistant while-in-use cover with key lockable/locking cover with keys to match owner standards.
- C Other special purpose receptacles shown on Drawings shall be of same quality.
- D GFI receptacles shall self test every 3 seconds and indicate if the GFI protection has passed or failed the test.
- E Wall Plates:
 - 1 Commercial: Satin finish stainless steel

- 2 Educational and medical: Satin finish stainless steel
- 3 Medical: Satin finish stainless steel
- 4 Residential:
 - a Material: Nylon
 - b Color: Match wall color
- F Switch and receptacle colors shall be as noted below unless otherwise specified.
 - 1 Job type dependant:
 - a Educational and medical: Gray
 - b Commercial: White
 - c Residential: Match wall color
 - 2 Feature type dependant (not job type dependant):
 - a Isolated Ground (IG) receptacle: Orange
 - b Equipment on emergency system: Red
 - c Receptacle with surge suppression: Blue
 - d Isolated ground receptacles with feature dependant color (other than orange) shall have orange triangle.
 - 3 Follow the facility has a color code scheme if the facility has one. Verify with owner.

2.2 TERMINAL CABINETS

- A Construction
 - 1 Fabricated from code gauge steel, size as indicated on drawings, with flush latch and concealed hinges and mounting screws.
 - 2 Enclosure for flush mounted cabinets shall be designed for flush mounting.
 - 3 Enclosure for surface mounted cabinets shall be designed for surface mounting.
- B Where size is not indicated, the minimum size shall be 24 inches wide x 30 inches high x 4 inches deep.
- C Cabinet shall be Square D "Mono-Flat Fronts", or approved equal.
- D Terminal cabinets shall include a backboard at inside back of cabinet.
 - 1 The backboard shall be 3/4" inch thick plywood
 - 2 Paint backboard with 3 coats of fire retardant paint.
- E Provide and install one terminal point for each wire within the terminal cabinet.
- F NEMA type:
 - 1 Interior, non-corrosive, non-hazardous (classified) locations: NEMA 1
 - 2 Exterior locations with vents: NEMA 3R
 - 3 Cooled enclosures: NEMA 4
 - 4 Enclosures containing electronics in dusty areas or outdoors: NEMA 4
 - 5 Enclosures in hazardous (classified) locations: NEMA 4 or 4X (corrosive locations) listed for hazardous classification
 - 6 Enclosure in corrosive locations: NEMA 4X
 - 7 All seams on NEMA 3R, 4, and 4X enclosures shall be continuously welded with welds ground smooth.
- G Coating
 - 1 The completed enclosure shall be degreased and cleaned.
 - 2 After the cleaning process is finished, the enclosure shall be phosphatized.
 - 3 After the phosphatizing, the enclosure shall receive an electrostatic deposition of polyester powder coating followed by baking to produce a hard durable finish.
 - a The minimum thickness of the paint film shall be 2.0 mils.
 - b For the exterior of transformer tank, interior and exterior of primary and secondary cable compartments the minimum total dry film thickness shall be 3.5 mils.
 - c Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
 - 4 Finish shall conform to UL 50 and UL 50E.
 - 5 Color shall be ANSI 61 Gray.

- 6 Coat underside surfaces of equipment outdoors or in damp locations with a corrosion resistant coating.

2.3 POWER DISTRIBUTION TERMINAL BLOCKS

- A Power distribution terminal blocks (PDTB) shall be finger-safe, NEMA 1 type.
- B Conducting material shall be copper.
- C Current rating and short circuit rating of PDTBs shall be no lower than upstream overcurrent protective device.
- D Terminals
 - 1 Each terminal shall be screw type and be designed for wire size connecting to it.
 - 2 PDTB shall have one terminal for each wire connected to it on both load and line sides.
- E Load wire sizes and OCPD shall comply with CEC 240.21(B) and 240.92(B) as well as all other applicable codes.
- F PDTBs shall have provisions for panel or DIN rail mounting.
- G PDTBs shall be mounted within enclosure unless otherwise noted.

2.4 NAMEPLATES

Provide and install nameplates per Section 260500.

PART 3 – EXECUTION

3.1 GENERAL

- A Electric system layouts indicated on the Drawings are generally diagrammatic, but shall be followed as closely as actual construction and work of other trades will permit. Govern exact routing of cable and wiring and the locations of outlets by the structure and equipment served. Dimensions shall be taken from Architectural Drawings.
- B Consult all other Drawings. Verify scales and report any dimensional discrepancies or other conflicts to architect, or engineer if no architect is involved, before submitting bid.
- C Home runs to panelboards are indicated as starting from the outlet nearest the panel and continuing in the general direction of that panel. Continue such circuits to the panel as though the routes were completely indicated. Terminate homeruns of signal, alarm, and communications system in a similar manner.
- D Avoid cutting and boring holes through structure or structural members wherever possible. Obtain prior approval of Architect and conform to structural requirements when cutting or boring the structure is necessary or permitted.
- E Furnish and install necessary hardware, hangers, blocking, brackets, bracing, runners, required for equipment specified under this section.
- F Provide necessary backing required to insure rigid mounting of outlet boxes.
- G Outlet boxes shall be plumb.
- H Back of wall plates shall be flush with wall finish. Gaps between wall plates and wall or wall plates not parallel to wall are not acceptable.

3.2 CONNECTIONS TO EQUIPMENT

- A General:
 - 1 Furnish and install required power supply conduit and wiring to equipment. See below for other wiring required.
 - 2 Install rough-in work for equipment from approved shop drawings to suit the specific requirements of the equipment.
 - 3 Furnish and install magnetic motor starters that are shown on the Drawings or specified under other divisions to be furnished under this division of work. Verify

- equipment nameplate ratings prior to installation and furnish adequately rated starters for the loads.
- 4 Furnish and install manual thermal protection for motors not integrally equipped with thermal protection.
 - 5 Furnish and install 120V power to each control panel and time switch requiring a source of power to operate.
- B Heating, ventilating, and air conditioning equipment:
- 1 Coordinate with mechanical contractor for sizes, locations and details of motors, heating units, and control requirements.
 - 2 Provide required power supply conduit and wiring to equipment.
 - 3 Provide a suitable means of disconnect switch immediately ahead of and adjacent to each motor and appliance unless the motor or appliance is located adjacent and within sight of the service panelboard, circuit breaker or switch at a distance allowed by codes. Verify equipment nameplate current ratings prior to installation. Provide a disconnect means at each magnetic motor starter.
 - 4 Provide magnetic motor starters required under this division of work.
 - 5 Provide manual thermal protection for motors not integrally equipped with thermal protection.
 - 6 Line and low voltage temperature control and interlock wiring, conduit, and required connections are a part of other divisions unless specifically shown or noted on the Drawings as to be furnished under this section.
 - 7 Provide 120V power supply to control panels, time switch furnished and installed under other divisions of work.
 - 8 Furnish and install 120V power to each duct detector scheduled for operation of fire dampers or shut down of mechanical equipment. Coordinate the exact quantity and locations with the mechanical drawings.
- C Plumbing and other contractor-furnished and Owner-furnished equipment:
- 1 Required power and control conduit, wiring and connections are included under this section of the work. Control sensing and alarm devices will be furnished under the respective section of the contract supplying the equipment unless noted otherwise. These devices will be located in pipes, ducts, vessels, tanks, etc., and will be mounted in a place by the Contractor furnishing the devices. Other devices shall be mounted under this section of the work.
 - 2 Control panels for packaged equipment will be furnished under the respective section of the contract supplying the equipment unless otherwise noted. Installation and connection of the control panels are under this section of the work.

3.3 IDENTIFICATION

Refer to Section 260500.

END OF SECTION

SECTION 262800 – LOW VOLTAGE (0-600V) CIRCUIT PROTECTIVE DEVICES

PART 1 – GENERAL

1.1 SECTION INCLUDES

Materials, equipment fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction, for overcurrent protective devices

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

Published specification standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.

- A California Building Code
- B California Electrical Code
- C Institute of Electrical and Electronic Engineers
 - 1 IEEE 1015: Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems
 - 2 IEEE 1458: Recommended Practice for the Selection, Field Testing, and Life Expectancy of Molded Case Circuit Breakers for Industrial Applications
- D Underwriters' Laboratories
 - 1 UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 2 UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 3 UL 98: Enclosed and Dead-front Switches
 - 4 UL 363: Knife Switches
 - 5 UL 489: Molded-case Circuit Breakers, Molded-case Switches, and Circuit Breaker Enclosures
 - 6 UL 977: Fused Power Circuit Devices
 - 7 UL 1066: Standard for Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
 - 8 UL 2367: Standard for Solid State Overcurrent Protectors
 - 9 UL 2566: Low Voltage Surge Withstand Telecommunications Fuses

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.

RSUSD - NEW KINDERGARTEN PROJECT

- E Deliver, store and protect products under provisions of Section 016200.
- F Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- G Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- H Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 A complete set of drawings for any special items
 - 7 Wiring diagrams
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Manufacturer's data sheets – When data sheets include more than one model the model(s) used shall be noted
 - 4 Manufacturer's programming, user, and maintenance manual(s), including troubleshooting guidelines
 - 5 Configuration settings
 - 6 Wiring diagrams
 - 7 Voltage ratings
 - 8 Current ratings
 - 9 Calibrated range
 - 10 List of capabilities
 - 11 Environmental ratings
 - 12 NEMA enclosure type
 - 13 Maintenance requirements
 - 14 Installation instructions
 - 15 Repair instructions
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 CIRCUIT BREAKERS

- A Circuit breakers shall be constructed in accordance with the following standards:
- 1 UL 489 or UL 1066
 - 2 Federal Specification W-C-375B/GEN
 - 3 NEMA AB1
 - 4 CSA 22.2, No. 5-M91
 - 5 IEC 157-1
 - 6 BS 4752
- B Construction
- 1 Circuit breakers shall be constructed using glass reinforced polyester insulating material providing superior dielectric strength.
 - 2 Current-carrying components shall be completely isolated from the handle and the accessory mounting area.
 - 3 Breaker contact material shall be a non-weldable silver alloy.
 - 4 Breakers shall have arc-extinguishing chutes.
 - 5 Circuit breakers shall have an over-center, trip-free, toggle operating mechanism which will provide quick-make, quick-break contact action.
 - 6 Multiple pole breakers shall have a common trip element and a single operating handle.
 - 7 Circuit breakers for branch circuits shall be molded case
 - 8 Circuit breakers shall have bolt-on/plug-on type bus connectors.
- C Trip type
- 1 Circuit breakers having a frame size of 150 amperes or less shall have thermal magnetic non-interchangeable, trip-free sealed trip units.
 - 2 Circuit breakers with a frame size of 175 amperes to 1200 amperes shall have interchangeable thermal and adjustable magnetic trip elements.
- D There shall be two forms of visible trip indication.
- 1 The breaker handle shall reside in a position between ON and OFF.
 - 2 In addition, there shall be a red trip indicator appearing in the clear window of the circuit breaker housing.
- E Circuit breakers shall be UL Listed with ampere ratings, interrupting ratings, and number of poles as indicated on the panelboard schedules.
- F Circuit breakers faceplates shall be marked with the following
- 1 Rated ampacity
 - 2 UL and IEC certification standards
 - 3 Applicable voltage systems and corresponding AIR ratings
- G Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 90°C rated wire, sized according to the 75°C temperature rating per CEC Table 310-16.
- H Branch circuit breakers rated 30 amperes and below shall be UL Listed to accept 60°C rated wire.
- I The interrupting capacity of all main and feeder branch circuit breakers shall be a minimum of 42,000A_{RMS} symmetrical amperes.
- J All circuit breakers feeding HVAC units, motors, or circuit breakers supplying loads other than convenience receptacles or lights shall have lockout devices.
- K Standard circuit breakers up to 250A at 600V_{AC} shall be UL Listed with HACR ratings.
- L All circuit breakers feeding 120V, 15A and 20A branch circuits in dwellings shall be AFCI.
- M Circuit breakers with shunt-trip or low voltage release shall be switch duty rated.

2.2 SAFETY SWITCHES (DISCONNECTS)

- A Switches shall be heavy duty type
- B Minimum voltage rating shall be 600V.

- C Minimum Size
 - 1 Switches for disconnecting motors shall be sized for the horsepower of for motor(s).
 - 2 All switches shall be sized per the overcurrent protective device protecting the switch.
- D Construction
 - 1 NEMA 1 for indoors
 - 2 NEMA 3R or NEMA 4 for outdoors
 - 3 Handle shall be lockable in the off/disconnected/open position.
- E Switch shall be equivalent to Square D H-rated series.
- F Finish: The entire enclosure shall be finished as follows.
 - 1 Degreasing
 - 2 Cleaning
 - 3 Phosphatizing
 - 4 Electrostatic deposition of polymer polyester powder coating followed by baking to produce a hard durable finish.
 - a The minimum thickness of the paint film shall be 2.0 mils.
 - b Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
 - 5 Finish shall conform to UL 50 and UL 50E.
 - 6 Color shall be ANSI 61 Gray.
 - 7 Coat underside surfaces of equipment outdoors or in damp locations with a corrosion resistant coating

PART 3 – EXECUTION

3.1 GENERAL

- A Electric system layouts indicated on the Drawings are generally diagrammatic, but shall be followed as closely as actual construction and work of other trades will permit. Govern exact routing of cable and wiring and the locations of outlets by the structure and equipment served. Dimensions shall be taken from Architectural Drawings.
- B Consult all other Drawings. Verify scales and report any dimensional discrepancies or other conflicts to architect, or engineer if no architect is involved, before submitting bid.
- C Furnish and install necessary hardware, hangers, blocking, brackets, bracing, runners, required for equipment specified under this section.

3.2 OVER CURRENT PROTECTION DEVICE COORDINATION STUDY

- A Contractor shall provide a coordination study to determine trip settings of circuit breakers and/or appropriate fuse types.
- B Fault, circuit overload, etc shall only trip closest circuit breaker or melt closest fuse. No other circuits shall be affected.
- C Contractor may elect to have the engineer of record provide such services at the contractor's expense.

END OF SECTION

SECTION 271500 - COMMUNICATIONS HORIZONTAL CABLING

PART 1 – GENERAL

1.1 SECTION INCLUDES

This section includes material and workmanship requirements for data, telephone (analog and VOIP), IP clocks, and IP speakers horizontal cabling.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D Plans
- E Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A. Governing Codes and Conflicts: If the requirements of the Construction Documents exceed those of the governing codes and regulations, then the requirements of the Construction Documents shall prevail. Where a conflict exists, the governing codes and ordinances shall supersede all other requirements.
- B. ANSI: American National Standards Institute (ANSI)
- C. CEC: California Electrical Code
- D. Institute of Electrical and Electronic Engineers (IEEE)
 - 1. IEEE 802.3: IEEE Standard for Ethernet
 - 2. IEEE 802.3ad: Link Aggregation
 - 3. IEEE 802.3af: Power over Ethernet
 - 4. IEEE 802.3at: Enhanced Power over Ethernet
- E. Insulated Cable Engineers Association (ICEA)
 - 1. ICEA S-84-608: Telecommunications Cables, Filled Polyolefin Insulated, Copper Conductor
 - 2. ICEA S-102-700: ICEA Standard for Category 6 Individually Unshielded, Twisted Pair Indoor Cables (With or Without an Overall Shield) for Use in Communications Wiring Systems Technical Requirements
- F. Telecommunications Industries Association (TIA)
 - 1. TIA-568-C: Commercial Building Telecommunications Standard
 - 2. TIA-568-C.0: Generic Telecommunications Cabling for Customer Premises
 - 3. TIA-568-C.1: Commercial Building Telecommunications Cabling Standard
 - 4. TIA-568-C.2: Balanced Twisted-Pair Telecommunications Cabling and Components Standards
 - 5. TIA-569-C: Commercial Building Standard for Telecommunications Pathways and Spaces
 - 6. TIA-606-B: Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - 7. TIA-607-B: Commercial Building Grounding and Bonding Requirements for Telecommunications
 - 8. TIA-758-B: Customer Owned Outside Plant Telecommunications Infrastructure Standard

9. TIA-1152: Requirements for Field Test Instruments and Measurements for Balanced Twisted Pair Cabling
 10. TIA-1183: Measurement Methods and Test Fixtures for Balun-less Measurement of Balanced Components and Systems
 11. TIA-TSB-36: Technical Systems Bulletin Additional Cable Specifications for Unshielded Twisted-Pair Cables
 12. TIA-TSB-67: TIA Telecommunications Systems Bulletin, Additional Transmission Specifications for Unshielded Twisted-Pair Connecting Hardware
 13. TIA-TSB-184: Guidelines for Supporting Power Delivery Over Balanced Twisted-Pair Cabling
 14. TIA-TSB-1197: Mode Conversion Parameters for Balanced Twisted Pair Cabling
- G. Underwriters Laboratories, Inc.
1. UL 444: Communications Cables
 2. UL 1666: Standard for Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts
 3. UL 1690: Standard for Data-Processing Cable
 4. UL 1863: Communications Circuit Accessories
 5. UL 1977: Component Connectors for Use in Data, Signal, Control, and Power Applications
 6. UL 2024: Standard for Signaling, Optical Fiber and Communications Raceways and Cable Routing Assemblies
 7. UL 2269: Optical Fiber/Communications/Signaling/Coaxial Cable Outlet Boxes
 8. UL 62368-1: Audio/video, information and communication technology equipment - Part 1: Safety requirements

1.4 QUALITY ASSURANCE

- A Contractor requirements:
- 1 The Contractor shall have successfully completed a minimum of 5 telecommunications projects of the same size and scope.
 - 2 Project Manager
 - a The Project Manager shall have successfully completed a minimum of 5 telecommunications projects of the same size and scope.
 - b The contractor shall make the project manager available to the Owner/Owner's Representative before the start of this project for an interview. This person must be deemed acceptable by the Owner and/or their Representative before work can begin.
 - c Project Manager will be required to be available for scheduled on site project meetings at no additional cost to the Owner.
 - d Project Manager will be required to be available to meet on site with the Owner/Owner's representative with a minimum of 24 hours notice for non-emergency issues, and a minimum of 4 hours for emergency issues at no additional cost to the Owner.
 - 3 The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context 'good quality' means the work shall meet industry technical standards and quality of appearance. The Owner reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.
 - 4 The Contractor shall provide all necessary materials and labor for a complete, functional Telecommunications cabling infrastructure in accordance with all applicable standards and the Construction Documents.
- B Material requirements
- 1 All material and equipment to be installed on this project will be new and free from defects.
 - 2 Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.

- 3 New material shall meet the following requirements.
 - a Manufactured within one year of the installation date.
 - b Undamaged
 - c Not previously installed
 - d Delivered to jobsite in original packaging
 - e No corrosion or other degradation of material
 - f In factory condition
 - g Unmodified
- 4 If used material or equipment has been installed on this project the Contractor shall replace said materials and/or equipment with new products at no additional cost to the Owner.
- 5 Equipment and accessories shall be in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- 6 Items of a given type shall be the products of the same manufacturer.
- 7 Deliver, store and protect products under provisions of Section 016200.
- 8 Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- 9 Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- 10 Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.
- C Contractor shall warranty all materials, equipment, and workmanship for a minimum of one (1) year.
 - 1 Warranty shall provide repair/replacement of all defective or improperly installed materials at no additional cost to the Owner (including all costs to repair or replace the item(s)).
 - 2 Contractor shall provide a competent service technician and new materials to repair/replace defective items no later than 24 hours after notification.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 A complete set of drawings for any special items
 - 7 A single line block diagram showing exactly the manner in which the contractor proposes to layout the system.
 - 8 Wiring diagrams
 - 9 Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Programming manual (where applicable)
 - 4 Wiring diagrams
 - 5 Trouble-shooting guidelines (where applicable)
 - 6 Voltage ratings
 - 7 Current ratings
 - 8 Calibrated range (where applicable)
 - 9 List of capabilities
 - 10 Environmental ratings
 - 11 NEMA enclosure type
 - 12 Maintenance requirements
 - 13 Installation instructions
 - 14 Repair instructions (where applicable)
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 GENERAL

- A. All material shall be UL listed for its application.
- B. Cables shall be rated for its intended use, i.e. plenum, riser, wet location, etc.
- C. Cables, conductors, and all other components shall meet the requirements of standards listed in Section 1.3.

2.2 DATA AND VOIP HORIZONTAL CABLING

- A. Contractor shall provide, install, and test a Cat-6 cable link from each Data/VOIP Outlet directly to the IDF utilizing the hardware listed below (or approved equivalent) in full compliance with all applicable standards, local and national codes, manufacturers' recommendations, and otherwise noted within these specifications.
- B. Specifications:
 - 1. Four twisted, unshielded, 23 AWG, solid copper pairs (23 AWG UTP)
 - 2. Suppress cross-talk
 - 3. Maintain 10GB/S performance
 - 4. Meet or exceed Cat-6 requirements of TIA-568-C.2 and IEEE 802.3an.
 - 5. SRL, Attenuation and NEXT results shall use Sweep Frequency test per TIA-568-C.
 - 6. Have UL verification to Cat-6 specifications.
 - 7. Compatible with IEEE 802.3at POE+
 - 8. Color for cables shall be blue.
 - 9. Berk-Tek LANmark-2000 or approved equal
- C. Cables shall be rated for its intended use, i.e. plenum, riser, wet location, etc.
- D. Cables, conductors, and all other components shall meet the requirements of standards listed in Section 1.3.
- E. Provide all termination accessories, dressing accessories, enclosures, and testing for a complete fiber optic distribution system. Refer to Specification Section 271100.
- F. Identification
 - 1. Interior: Panduit S100X225YAJ self-laminating, polyester label

- 2. Exterior: Panduit MT350W17-Q stainless steel tag with rounded edges & corners
- G. Contractor shall determine cable "link" quantities as shown on the Construction Documents.

2.4 OUTLET HARDWARE

- A Data and VOIP Ports:
 - 1 Category 6, RJ45 port: Panduit CJ688TGBUY
 - 2 Terminate 26AWG to 22 AWG, stranded or solid, Cat-6 cables without punch-down tool
 - 3 Suppress cross-talk
 - 4 Maintain 1GB/S performance in 48 port, 1RU patch panels
 - 5 T568B wiring scheme
 - 6 Meet or exceed Cat-6 requirements of TIA-568-C.2.
 - 7 Compatible with IEEE 802.3at POE+
 - 8 Snap in, snap out modular design
 - 9 Conductor retention and strain relief
 - 10 Gold plated contacts
- B Wallplates:
 - 1 Commercial , educational, industrial, and institutional
 - a Material: Satin finish stainless steel
 - b For data or telephone – one module space: Black Box WP370 or equivalent
 - c For data and telephone – two module spaces: Black Box WP371, Panduit CFPL2SY, or equivalent
 - d For data and telephone – two module spaces: Black Box WP373, Panduit CFPL4SY, or equivalent
 - 2 Residential:
 - a Material: Nylon
 - b Color: Wallplate color shall closely match wall color.
 - c For data or telephone – one module space: Panduit NK1FNWH or equivalent
 - d For data and telephone – two module spaces: Panduit NK2FNWH or equivalent
 - e Wallplate Specifications: The wallplate housing shall be a one-piece, single-gang flush mount style that fits standard NEMA openings, on four-square boxes with reducer. It should provide 1-port field-configurable with a variety of simplex snap-in ports/connectors. It must be made of high-impact, self-extinguishing plastic rated UL 94V-0, and be UL Listed, CSA certified, and compliant with FCC Part 68 and TIA-568-C specifications. Wallplate screws must match wallplate color.
 - 3 Provide an install a blank module for each unused opening in the wallplates, Panduit CMBIG-X or equivalent.
 - 4 Labels: Panduit C125X030YPT self-adhesive, polyester label
- C Back box: 4 inch square box with one gang plaster

2.5 MISCELLANEOUS MATERIALS

- A Conduits: Refer to Section 260500.
- B Supports: Refer to Section 260529.
- C J-Hooks shall be steel with closure and two bolt holes. Finished part shall be hot dipped galvanized.

2.6 IDENTIFICATION

- A Interior: Panduit #S100X225YAJ self-laminating, polyester label

- B Exterior: Panduit #MT350W17-Q stainless steel tag with rounded edges & corners

PART 3 – EXECUTION

3.1 INSTALLATION

- A Cables
- 1 Cable shall be installed in accordance with manufacturer's recommendations and best industry practices.
 - 2 Contractor shall use Velcro strip to bundle cables together. Tie Wraps will not be allowed for supporting, bundling, and/or dressing of any cables.
 - 3 Contractor shall provide a three foot service loop for all cables. The service loop will be coiled and secured using Velcro in the accessible ceiling at the conduit stub to the work area outlet box.
 - 4 A 1/8" diameter, nylon pull cord shall be co-installed with all cable installed in any conduit.
 - 5 Cable raceways shall not be filled greater than the TIA-569-C maximum fill for the particular raceway type or 40%.
 - 6 Cables shall be installed in continuous lengths from origin to destination. Splices are not permitted.
 - 7 Do not exceed the manufacturer's minimum bend radius and maximum pulling tension for cables.
 - 8 Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
 - 9 Cables shall be dressed and terminated in accordance with the recommendations made in the TIA-568-C standards, manufacturer's recommendations, and best industry practices.
 - 10 The cable jacket shall be maintained to within 1/2 inch of the termination point.
 - 11 Vertical runs of cable shall be supported to messenger strand, cable ladder, or other method to provide proper support for the weight of the cable every 3 feet.
 - 12 Large bundles of cables and/or heavy cables shall be attached using metal clamps and/or metal banding to support the cables.
 - 13 All cables shall be neatly bundled and dressed continuously from the entrance point of the data room or cabinet to their respective panels. Each panel shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame. Cables in all other rooms shall be concealed.
 - 14 Inside Buildings: Cable and conductors shall be routed in conduit, or surface mounted raceway, run overhead and parallel to the structure.
 - a Conduit shall be rigid steel, IMC, or EMT as described elsewhere in these specifications.
 - b Plastic conduit shall not be used above grade.
 - c Cable may be used behind accessible T-bar ceilings without conduit. Mount cable at the roof joist (or bottom of floor above) on 1" wide 'J-hooks' or 'bridle-rings' at every 5'-0" or less. Support each cable within 1'-0" of its termination point. Run cable parallel and perpendicular to the building structure and provide mechanical support for vertical runs by using Unistrut channel securely fastened in place.
 - d Cable and conductors shall not be attached to the support wire of the T-bar ceiling or laid across the ceiling boards.
 - 15 Between buildings: Cable and conductors shall be routed in conduit run underground.
 - a Conduit shall be rigid steel, IMC, or plastic as described elsewhere in these specifications.
 - b The use of EMT is not acceptable.

- 16 On The Roof: Conduit shown on the drawings as being on the roof of the building or covered walkway shall be installed on 4" by 4" pressure treated wood blocking (sleepers) attached to the structure every 8'-0" or less.
 - a Conduit shall be rigid steel or IMC as described elsewhere in these specifications.
 - b The use of EMT or plastic conduit is not acceptable.
 - 17 Make all underground runs continuous without splices or taps. Use underground boxes for *pulling purposes only*.
 - 18 Only use pulling grip approved by the cable manufacturer.
 - 19 Clean conduit with mandrel prior to pulling.
 - 20 Make all connections and splices in a clean environment.
 - 21 Follow cable manufacturer's and device manufacturer's instructions for connections to devices.
 - 22 Maximum combined cable length (patch cords and installed cable) from switch to end user equipment shall be 328 feet.
 - 23 Stranded conductors shall be "tinned" with solder before terminations are made.
 - 24 Make all terminations in cabinets and at terminal backboards on terminal blocks and/or Patch Panels as specified above.
- B Outlets Installation
- 1 No more than 12" of cable shall be stored in an outlet box, modular furniture raceway, or insulated walls.
 - 2 Data jacks, unless otherwise noted in drawings, shall be located in the top position(s) of each faceplate. Data jacks in horizontally oriented faceplates shall occupy the left-most position(s).
 - 3 Voice jacks, unless otherwise noted in drawings, shall occupy the next position(s) below the data on the faceplate. Voice jacks in horizontally oriented faceplates shall occupy the position right of the data jack.
 - 4 All faceplates installed shall be level.

3.2 LABELING

- A. The contractor shall follow the Owner's labeling scheme.
- B. Label each cable at its beginning and end points no further than 6" behind termination on a section of cable that is easily accessible. Cable labels shall include the ids of both terminations and cable id.
- C. All labels shall be machine printed or embossed. Handwritten labels are not acceptable.
- D. All labeling information shall be recorded on the as-built drawings and all test documents.
- E. Label all cable beginning and terminating points.
- F. Labels for site cables and cables in multiple buildings shall feature the following.
 1. Identify origin (MDF or IDF and building), termination (IDF or port identifier), and next pull box.
 2. Cables in pull boxes shall have a label at entry into pull box and exit from pull box. Labels shall be stainless steel tags with embossed characters.

3.3 TESTING

- A. General
 1. All cables (including each fiber) and termination hardware shall be tested.
 2. Testing must comply with TIA standards for testing (refer to Section 1.3), plans, specifications, and manufacturer recommendations.
 3. Contractor shall notify the Owner or Owner's Representative 72 hours before commencement of testing.
 4. Upon receipt of the test documentation, the Customer reserves the right to have the contractor perform a 20% witnessed "spot testing" of the cabling system to validate test results provided in the test document, at no additional cost. If a

- significant amount of cables are marginal and/or fail during the "spot test"
Contractor will retest the entire cable plant at no additional cost.
- B. Equipment
 - 1. All equipment must be properly calibrated and traceable to NIST.
 - 2. Equipment shall have been recalibrated within the previous 6 month prior to testing.
 - C. Data Copper Cables:
 - 1. Each pair in each cable shall be tested in accordance with TIA-568-C series and TIA-TSB-67 for:
 - a. Opens
 - b. Shorts
 - c. Grounds
 - d. Continuity
 - e. Polarity
 - f. DC resistance
 - g. DC resistance unbalance
 - h. Impulse noise
 - i. Signal attenuation
 - j. NEXT
 - k. PS-NEXT
 - l. ELFEXT
 - m. PS-ELFEXT
 - n. Return loss
 - o. Propagation delay
 - p. Delay skew
 - 2. Each installed cable link shall be tested for installed length using a TDR type device. Cable lengths shall be recorded, referencing the cable identification number and circuit or pair number.
 - 3. Conductors and connectors shall be tested as a complete system.
 - 4. Testing of all horizontal cable, outlet ports, patch cords, and riser cable pairs shall include end-to-end tests using a Wavetech Lantech 100 or Fluke Network's DXT CableAnalyzer Series scanner.
 - 5. Test cables to check that they meet all IEEE and TIA Cat-6 and 1GB/S performance specifications (refer to Section 1.3).
 - 6. All installed cables must meet or exceed the defined standards for performance. The Contractor shall take all steps necessary to repair or replace any optic not meeting the standard.
 - 7. Test results shall be automatically evaluated by the equipment, using the most up-to-date criteria from the TIA standards.
 - 8. The test equipment shall provide a printed document for each test that is also available in a downloadable file using an application from the test equipment manufacturer. The printed test results shall include a print out of all tests performed, and the individual test results for each cable.

3.4 SYSTEM CLOSEOUT AND AS-BUILT DOCUMENTATION

- A Upon completion of the installation, the telecommunications contractor shall provide three (3) full documentation sets to the Owner's Representative/Engineer for approval. One (1) to be a hardcopy and two (2) to be electronic copies. Documentation shall include the items detailed in the sub-sections below.
- B Documentation shall be submitted within ten (10) working days of the completion of each testing phase. This is inclusive of all test results and draft as-built drawings. Draft drawings may include annotations done by hand. Machine generated (final) copies of all drawings shall be submitted within 30 calendar days of the completion of each testing phase. At the request of the Owner's Representative/Engineer, the telecommunications contractor shall provide copies of the original test results.

- C The Owner's Representative/Engineer will request that a 10% random field re-test be conducted on the cable system, at no additional cost, to verify documented findings. Tests shall be a repeat of those defined above. If findings contradict the documentation submitted by the telecommunications contractor, additional testing can be requested to the extent determined necessary by the Engineer, including a 100% re-test. This re-test shall be at no additional cost to the Owner.
- D Test Results documentation shall be provided in two media, as listed above, one (1) hardcopy and one (1) on disk within three weeks after the completion of the project. The documentation shall be clearly marked on the outside front cover with the words "Project Test Documentation", the project name, and the date of completion (month and year). The results shall include a record of test frequencies, cable type, conductor pair and cable (or outlet) I.D., measurement direction, reference setup, and crew member name(s). The test equipment name, manufacturer, model number, serial number, software version and last calibration date will also be provided at the end of the document. Unless the manufacturer specifies a more frequent calibration cycle, a bi-annual calibration cycle is anticipated on all test equipment used for this installation. The test document shall detail the test method used and the specific settings of the equipment during the test as well as the software version being used in the field test equipment.
- E Printouts generated for each cable by the wire test instrument shall be submitted as part of the documentation package.
- F When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall be documented.
- G The As-Built drawings are to include cable routes, outlet locations and the approved labeling identifiers. Their sequential number as defined elsewhere in this document shall identify outlet locations. Numbering, icons, and drawing conventions used shall be consistent throughout all documentation provided. The Owner will provide floor plans in paper and electronic (DWG, AutoCAD 2008) formats on which as-built construction information can be added. These documents will be modified accordingly by the telecommunications contractor to denote as-built information as defined above and returned to the Owner.
- H Contractor will provide one laminated 11"x17" drawing at each IDF and MDF that includes the building layout for that IDF or MDF, along with the outlet locations and all of the approved labeling.

END OF SECTION

SECTION 275116 – PUBLIC ADDRESS AND CLOCK SYSTEMS

PART 1 – GENERAL

1.1 SECTION INCLUDES

Materials, equipment, fabrication, installation and tests in conformity with equipment applicable to this project for the following:

- A. Public Address equipment.
- B. Interface to Owner's Telephone System.
- C. Conduit and raceways.
- D. Wire and cable.
- E. Grounding.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.

- A. CEC: California Electrical Code
- B. NFPA: National Fire Protection Agency
 - 1. NEC: National Electrical Code
- C. Underwriters Laboratories, Inc.
 - 1. UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 2. UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 3. UL 1690: Standard for Data-Processing Cable
 - 4. UL 1863: Communications Circuit Accessories
 - 5. UL 1977: Component Connectors for Use in Data, Signal, Control, and Power Applications
 - 6. UL 2024: Standard for Signaling, Optical Fiber and Communications Raceways and Cable Routing Assemblies
 - 7. UL 2416: Audio/Video, Information, and Communication Technology Equipment Cabinet, Enclosure, and Rack Systems
 - 8. UL 2572: Control and Communication Units for Mass Notification Systems
 - 9. UL 62368-1: Audio/video, information and communication technology equipment - Part 1: Safety requirements

1.4 QUALITY ASSURANCE

RSUSD - NEW KINDERGARTEN PROJECT

- A Equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Installation and start up of the system shall be under the direct supervision of a local agency regularly engaged in installation, repair, and maintenance of such systems. The supplier shall be accredited by the proposed equipment manufacturers and be prepared to offer a service contract for system maintenance on completion of the guarantee period.
- F The agency providing equipment shall be responsible for providing all specified equipment and mentioned services for all equipment as specified herein. The agency must be an authorized distributor of specified equipment for single source of responsibility and shall provide documents proving such. The agency must provide written proof that the agency is adequately staffed with factory-trained technicians for all of the specified equipment. The agency must have established business for and currently be providing all services for the equipment to be provided for a minimum of five (5) years.
- G The contractor shall guarantee availability of service by factory-trained personnel of all specified equipment from the authorized distributor of all equipment specified under this section. On-the-premise maintenance shall be provided at no cost to the purchaser for a period of one (1) year (parts and labor) from date of acceptance unless damage or failure is caused by misuse, abuse, neglect, or accident. Additionally, all Rauland-Borg manufactured products are covered by a five (5) year (parts only) limited warranty from the date of acceptance. The warranty period shall begin on the date of acceptance by the owner/engineer.
- H The contractor shall, at the owner's request, make available a service contract offering continuing factory authorized service of the system after the initial warranty period.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 A complete set of drawings for any special items
 - 7 A single line block diagram showing exactly the manner in which the contractor proposes to layout the system.
 - 8 Wiring diagrams
 - 9 Illustrations and scale drawing of the racks, equipment layouts etc.
 - 10 Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

RSUSD - NEW KINDERGARTEN PROJECT

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Programming manual (where applicable)
 - 4 Wiring diagrams
 - 5 Trouble-shooting guidelines (where applicable)
 - 6 Voltage ratings
 - 7 Current ratings
 - 8 Calibrated range (where applicable)
 - 9 List of capabilities
 - 10 Environmental ratings
 - 11 NEMA enclosure type
 - 12 Maintenance requirements
 - 13 Installation instructions
 - 14 Repair instructions (where applicable)
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 BASIC SYSTEM

- A The system shall provide secondary automatic audio distribution of program tone signals, audio programs, public address, paging by zones with emergency announcement override. Input to the public address and paging functions of the system shall be provided by a direct interface to the Owner's telephone system and an administrative handset with dial-up function. Provide complete and satisfactorily operating Integrated Intercom/Communications System as described herein, using materials and equipment of types, sizes, ratings, and performances as indicated. Use materials and equipment that comply with referenced standards and manufacturer's standard design and construction, in accordance with published product information. Coordinate the features of all materials and equipment so they form an integrated system, with components and interconnections matched for optimum performance of specified functions.
- B Features offered by this system shall be implemented and controlled by software programs that can be changed and expanded as customer needs evolve.
- C The system shall allow system monitoring and administration from a computer.
- D The system shall be an electronic system consisting of one or two amplified intercom channels, (classroom) speakers, call switches, and/or telephones, digital readout for display of call origination, and solid state logic and sensing.
- E The system shall have the ability to provide multiple zone program distribution which is not interrupted by intercom communications.
- F The system shall lend itself to expansion by simple addition of modules.
- G The central switching system shall provide for switching of the intercom talk path to a telephone mode, during the course of a call.
- H The system shall be equipped with voice prompting to identify the calling station and respective call priority.
- I Room speakers and/or call switches shall be programmable and may be assigned any three, four or five digit number. Any room number may be reassigned at any time, and it shall not be dependent on wiring or circuit numbers.
- J Sixteen (16) separate paging zones shall be provided; each location shall be programmed in software to belong to any combination of software zones. Zones shall be programmed per Owner's directions.

- K Each dialing administrative telephone, if used, in the system shall be programmable for the following options:
 - 1 Allow zone paging
 - 2 Allow All-Page announcements
 - 3 Allow Executive Override
 - 4 Allow Emergency paging
 - 5 Allow activation of Time Zone tones
 - 6 Set the priority level and target display of "normal" calls
 - 7 Set the priority level and target display of "emergency" calls
 - 8 Assignment of architectural number
 - 9 Class of Service
 - 10 Assignment of associated speaker to paging zone
 - 11 Automatic Call-Back-Busy
 - 12 Call Forward-No Answer
 - 13 Call Forward-Busy
 - 14 Allow activation of security monitoring functions on a per-room and per-zone basis
- L Amplified two-way voice communication shall be available from any dial phone in the system, through any speaker in the system. This shall allow hands-free communication to any classroom or any individual loudspeaker unit. A programmable pre-announce tone shall sound immediately before the intercom path is opened and a supervisory tone shall continue to sound at regular intervals when speaker monitoring is active.
- M The system shall allow room or area security monitoring features. This will include the ability to support motion detectors or normally open alarm inputs.
- N The system shall allow system monitoring and administration from a local computer connected via the LAN.

2.2 EQUIPMENT RACK (EXISTING)

2.3 PROGRAM UNIT

- A. The existing unit is the Bogen IP Multicom.

2.4 AMPLIFIERS

- A. The Amplifiers shall be capable of delivering an audio output of 250 watts RMS at less than 2% distortion (+-.5 dB, 50-15,000 Hz.). Frequency response shall be +-2 dB, 30-20,000 Hz. Hum and noise level shall be at least 80 dB below rated power output.
- B. Include self-restoring protective circuit to safeguard against damage from prolonged overloads and extreme overloads.

2.5 SPEAKER CONTROL ASSEMBLIES (EXISTING)

2.6 SPEAKER ASSEMBLIES

- A Interior speakers next to clocks: Use this assembly where speakers and clocks are shown on the drawings as mounted next to each other.
 - 1 Surface Mounted – Use on existing walls only
 - a Bogen Wall Baffle Speakers: MB8TSLVR Metal Box Speaker loudspeaker
- B Exterior speakers
 - 1 Surface Mounted – Use on existing walls only
 - a Bogen FMH15T
 - b Mounted in BBSM6 surface-mounted vandal-resistant enclosure with FMHAR8 adapter ring and SGHD8 heavy duty grille.

2.7 CLOCKS

- A. Standard, Digital 4 Digits 2.5", Surface, 24V mount BCBD 3000 Series Wired Clock (V3.4)

2.8 CABLE AND CONDUCTORS

- A From each speaker to SCTB
 - 1 Interior, non-plenum rated: West-Penn 357 or approved equal
 - a UL Listed NEC Type CMR or CL3 constructed in accordance with UL Standards 13, 444, & 1666.
 - b One 22AWG UTP and one 22AWG STP
 - c Two (2) conductors are for connection to the speaker and two (2) conductors are spares.
 - 2 Interior, plenum rated: West-Penn 25357B or approved equal
 - a UL Listed NEC Type CMP or CL3P constructed in accordance with UL Standards 13, 444, & 1666
 - b One 22AWG UTP and one 22AWG STP
 - c Two (2) conductors are for connection to the speaker and two (2) conductors are spares.
 - 3 Underground: West-Penn AQC357 or approved equal
 - a UL Listed NEC Type CM or CL3 constructed in accordance with UL Standards 13 and 1685
 - b One 22AWG UTP and one 22AWG STP
 - c Two (2) conductors are for connection to the speaker and two (2) conductors are spares.
- B From SCTB to PA rack
 - 1 Interior, non-plenum rated: West-Penn D434 & 274 or approved equal
 - a UL Listed NEC Type CMR or CL3 constructed in accordance with UL Standards 13, 444, & 1666.
 - b Twelve 22AWG STPs & Fifteen 22AWG conductors
 - 2 Interior, plenum rated: West-Penn D25434 & 25274B or approved equal
 - a UL Listed NEC Type CMP or CL3P constructed in accordance with UL Standards 13, 444, & 1666
 - b Twelve 22AWG STPs & Fifteen 22AWG conductors
 - 3 Underground: Multipair 14AWG MWP alpha wire M8744160 BK001 or approved equal.
 - a 500ft. use for speaker at 25V.
 - b 1000ft. for speakers, utilize step-up and step-down 70V transformer.
 - c UL Listed NEC Type CM or CL3 constructed in accordance with UL Standards 13 and 1685
 - d Sixteen pair 14AWG STPs.
 - 4 Provide quantities of cables as required to provide a minimum of 1.5 STP and 1.5 UTP for each speaker.

PART 3 – EXECUTION

3.1 EQUIPMENT(EXISTING)

- A. The Equipment Rack shall contain the program unit, amplifiers, speaker control assemblies, AM-FM Tuner and CD player, transformers, power supplies and other associated equipment or devices necessary for supporting the entire system.
- B. Install the Administrative Telephone on a desk in the room with the Equipment Rack. The Owner will select the desk or location for the telephone.

3.2 SPEAKERS

- A. Speakers shall be installed where shown on the drawings.
- B. Verify mounting heights and exact locations of speakers as they relate to doors, windows, cabinets, white boards, tack boards and other interior elevations with the Architect prior to installation.
- C. Verify mounting heights and exact locations of exterior speakers with the Architect prior to installation.

3.3 CONDUIT, CABLE, AND CONDUCTORS – INSTALLATION

- A. Inside Buildings: Cable and conductors shall be routed in conduit run overhead and parallel to the structure.
 - 1. Conduit shall be rigid steel, IMC or EMT as described elsewhere in these specifications.
 - 2. Plastic conduit shall not be used above grade.
 - 3. Plenum rated cable may be used behind accessible T-bar ceilings only. Mount cable at the roof joist (or bottom of floor above) on "J-hooks" at every 8'-0" or less. Support each cable within 1'-0" of its termination point. Run cable parallel to the building structure and provide mechanical support for vertical runs by using unistrut channel securely fastened in place.
 - 4. Cable and conductors shall not be attached to the support wire of the T-bar ceiling or laid across the ceiling boards.
- B. Between buildings: Cable and conductors shall be routed in conduit run underground.
 - 1. Conduit shall be rigid steel, IMC, or plastic as described elsewhere in these specifications.
 - 2. The use of EMT is not acceptable.
- C. On The Roof: Conduit shown on the drawings as being on the roof of the building or covered walkway shall be installed on 4" by 4" wood blocking (sleepers) attached to the structure every 8'-0" or less.
 - 1. Conduit shall be rigid steel or IMC as described elsewhere in these specifications.
 - 2. The use of EMT or plastic conduit is not acceptable.
- D. Terminations:
 - 1. Stranded conductors shall be "tinned" with solder before terminations are made.
 - 2. Make all terminations in cabinets and at terminal backboards on Telco type terminal blocks or other terminal blocks approved by the engineer.
 - 3. Make all underground terminations, splices and taps waterproof and in approved pull boxes only. Splices and taps shall not be made inside conduit.

3.4 LABELING

- A Label all conductors, conduit, terminal blocks, patch panels, modular jacks, outlets and any termination point associated with the cable installation.
- B Follow the Panduit Company "Labeling Guide for ANSI/TIA/EIA-606" manual and use the products specified therein.

3.5 TESTING

- A All copper cables shall be tested for opens, shorts, grounds, continuity, polarity, DC resistance, impulse noise, and signal attenuation.
- B Rectify deficiencies indicated by tests and completely re-test work affected by such deficiencies at Contractor's expense. Verify by the system test that the total system meets the Specifications and complies with applicable standards.

3.6 FIELD QUALITY CONTROL

- A Manufacturer's Field Services: Provide services of a duly factory authorized service representative for this project location to supervise the field assembly and connection of components and the pre-testing, testing, and adjustment of the system.
- B Inspection: Make observations to verify that units and controls are properly labeled, and interconnecting wires and terminals are identified. Provide a list of final tap settings of paging speaker line matching transformers.

3.7 COMMISSIONING

- A Train Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Provide a minimum of 3 hours training. Operators Manuals and Users Guides shall be provided at the time of this training.
- B Schedule training with Owner with at least seven days advance notice.

3.8 CLEANING AND PROTECTION

Prior to final acceptance, clean system components and protect from damage and deterioration.

END OF SECTION

SECTION 283100 – FIRE DETECTION AND ALARM

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. This section of the specification includes the furnishing, installation, connection and testing of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete system.
- B. The intent of drawings and specifications is to result in a complete and functional Fire Alarm System as described herein. The Contractor shall provide all control panels, initiation devices, notification appliances, controls, supervisory devices, and any other device necessary to accomplish this intent, whether or not specifically shown or specified.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A. Published specifications standards, tests, or recommended methods of trade, industry or government organizations apply to work in this section as cited here and in Section 260000.
- B. National Fire Protection Association (NFPA) :
 - 1. NFPA 70 National Electrical Code (NEC)
 - 2. NFPA 72 National Fire Alarm and Signaling Code
 - 3. NFPA 101 Life Safety Code
- C. Underwriters Laboratories Inc. (UL):
 - 1. UL 38 Manually Actuated Signaling Boxes.
 - 2. UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 3. UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 4. UL 268 Smoke Detectors for Fire Protective Signaling Systems
 - 5. UL 268A Smoke Detectors for Duct Applications.
 - 6. U; 346 Water flow Indicators for Fire Protective Signaling Systems.
 - 7. UL 464 Audible Signaling Appliances.
 - 8. UL 521 Heat Detectors for Fire Protective Signaling Systems
 - 9. UL 753: Alarm Accessories for Automatic Water Supply Control Valves for Fire Protection Service
 - 10. UL 864 Control Units for Fire Protective Signaling Systems
 - 11. UL 1425: Standard for Cables for Non-Power-Limited Fire-Alarm Circuits
 - 12. UL 1480: Speakers for Fire Alarm, Emergency, and Commercial and Professional Use
 - 13. UL 1481: Power Supplies for Fire Protective Signaling Systems
 - 14. UL 1711: Amplifiers for Fire Protective Signaling Systems

- 15. UL 1712: Tests for Ampacity of Insulated Electrical Conductors Installed in the Fire Protective System
- 16. UL 1971 Visual Notification Appliances for the hearing impaired.
- D. Local and state building codes, including but not limited to:
 - 1. California Building Code
 - 2. California Electric Code
 - 3. California Fire Code
- E. All requirements of the Authority Having Jurisdiction (AHJ).

1.4 QUALITY ASSURANCE

- A. The FACP, initiation devices, monitoring devices, control devices, and annunciators shall:
 - 1. Be the product of a single U.S. manufacturer regularly engaged in its manufacture
 - 2. Share a common communications protocol
- B. All signaling devices shall be the product of a single U.S. manufacturer regularly engaged in its manufacture.
- C. All equipment and accessories shall be new and free from defects.
- D. Equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- E. Provide surge suppression, refer to Section 264300.
- F. All components shall be UL listed.
- G. All components shall be CSFM listed.
- H. The fire alarm system shall be manufactured by an ISO 9001 certified company and meet the requirements of BS EN9001: ANSI/ASQC Q9001-1994.
- I. The fire alarm system shall comply with requirements of NFPA Standard 72 for Protected Premises Signaling Systems, California Electric Code, California Fire Code, and all other state and local codes. The system shall be electrically supervised and monitor the integrity of all conductors.
- J. The installing company shall employ NICET (minimum Level II Fire Alarm Technology) technicians on site to guide the final checkout and to ensure the systems integrity.

1.5 SUBMITTALS

- A. Submit under provisions of Section 013000 or 013300.
- B. Submittals shall include the following:
 - 1. Table of contents
 - 2. A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3. Part numbers
 - 4. Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5. Maintenance instructions and intervals
 - 6. A complete set of drawings for any special items
 - 7. A single line block diagram showing exactly the manner in which the contractor proposes to layout the system.
 - 8. Wiring diagrams
 - 9. Illustrations and scale drawing of the racks, equipment layouts etc.
 - 10. Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
- C. The shop drawing submittal shall include the following:
 - 1. Plans, scale shall match scales of the approved plans
 - a. Site Plan
 - b. Floor Plans
 - (1) Identifying each room's use or occupancy
 - (2) Show device locations
 - (3) Show circuit routing

2. Diagram of the power circuit.
 3. Riser Diagram, break down by zone or circuit.
 4. Point-to-Point diagram for all devices.
 5. Type of wire being used and that the wire is being run in conduit or FPL rated.
 6. Cut sheets for all devices, highlight actual devices to be used and their amp draw in stand-by and alarm modes.
 7. Current California State Fire Marshall listing sheets
 8. Battery Calculations for 24 hours and 5 minute alarm.
 9. Voltage-Drop Calculations.
 10. Indicate all the California State applicable codes relating to the fire alarm system:
 - a. Section 2-809 and Ch2-72, T-24 CBC.
 - b. Article 3-760, T-24 CEC.
 - c. Current Edition of NFPA 72.
 11. Provide documentation from Local Fire Jurisdiction approving Zone breakdown and location of any Fire Alarm Annunciators.
- D. Electronic submittals shall be searchable
- E. The submittal shall be substantially complete for all items and equipment furnished under this section.
- F. Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- G. Substitutions
1. Items of same function and performance shall be submitted in conformance with Division 1.
 2. All proposed substitutions shall be listed with the California State Fire Marshal.
 3. All proposed substitutions shall require approval of the Division of the State Architect.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
- 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Programming manual (where applicable)
 - 4 Wiring diagrams
 - 5 Trouble-shooting guidelines (where applicable)
 - 6 Voltage ratings
 - 7 Current ratings
 - 8 Calibrated range (where applicable)
 - 9 List of capabilities
 - 10 Environmental ratings
 - 11 NEMA enclosure type
 - 12 Maintenance requirements
 - 13 Installation instructions
 - 14 Repair instructions (where applicable)
- C Provide manuals in one of the following formats
- 1 Three hardcopies
 - 2 PDF

1.7 WARRANTY

All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included in the submittal bid.

1.8 SUBSTITUTIONS

- A. For any proposed substitution a complete description, technical and cost comparison, and test report package shall be submitted to the Owner for review fifteen (15) working days prior to the bid date. Final approval of the substitution item shall be at the option of the Owner, and written notice of the status of the proposed alternative will be supplied to all bidders prior to the final bid date. The Owner or its representative must approve any proposed substitution item in writing. The Owner reserves the right to require a complete sample of any proposed equal item and may, if necessary, request a sample tested by an independent testing consultant to prove equality. The decision of the Owner regarding equality of proposed equal items will be final.
- B. Approved equal status does not imply final acceptance. The Owner prior to the award of bid shall make final acceptance of a substitution item to the successful Contractor, after reviewing the bid information.
- C. If a substitution item is given final acceptance by the Owner, the Contractor shall reimburse the Architect for any additional engineering charges and shall pay all charges of the other trades resulting from the substitution, at no cost to the Owner. This reimbursement shall include all costs required to obtain re-approval from DSA, as the currently specified fire alarm system has been approved in its entirety by DSA.
- D. If a substitution item is given final acceptance by the Owner, the Contractor shall pay all charges (including travel, lodging, meals, etc.) required to provide factory certification, equal to that of a Factory Authorized Distributor of the substituted item, for two (2) selected Owners representatives. This training shall occur at the primary factory of the substituted item in question and shall allow the selected Owners representatives to provide any and all Factory/Manufacturer Approved repairs, services, software upgrades, etc. without affecting any available or applicable Manufacturer Warranties.
- E. All of the equipment in this specification shall be furnished and installed by the Authorized Factory Distributor of the equipment with the most current software package available at the time of installation. At the time of Owner Acceptance of the installation, all equipment shall include any and all updated software revisions. In addition, when the software is available in disk format, a backup copy of the most up to date revision, in disk format, shall be handed to the Owner at the completion of the project.

1.9 POST CONTRACT MAINTENANCE

- A. Complete maintenance and repair service for the fire alarm system shall be available from a factory trained authorized representative of the manufacturer of the major equipment for a period of five (5) years after expiration of the guaranty.
- B. As part of the bid/proposal, include a quote for a maintenance contract to provide all maintenance, tests, and repairs described below. Include also a quote for unscheduled maintenance/repairs, including hourly rates for technicians trained on this equipment, and response travel costs for each year of the maintenance period. Submittals that do not identify all post contract maintenance costs will not be accepted. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty.
- C. Maintenance and testing shall be on a semiannual basis or as required by the AHJ. A preventive maintenance schedule shall be provided by the contractor describing the protocol for preventive maintenance. The schedule shall include:
 - 1. Systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, waterflow switches and all accessories of the fire alarm system.
 - 2. Each circuit in the fire alarm system shall be tested semiannually.
 - 3. Each smoke detector shall be tested in accordance with the requirements of NFPA 72 Chapter 14.

1.10 POST CONTRACT EXPANSIONS

- A. The contractor shall have the ability to provide parts and labor to expand the system specified, if so requested, for a period of five (5) years from the date of acceptance.
- B. As part of the submittal, include a quotation for all parts and material, and all installation and test labor as needed to increase the number of intelligent or addressable devices by ten percent (10%). This quotation shall include intelligent smoke detectors, intelligent heat detectors, addressable manual stations, addressable monitor modules and addressable modules equal in number to one tenth of the number required to meet this specification (list actual quantity of each type).
- C. The quotation shall include installation, test labor, and labor to reprogram the system for this 10% expansion. If additional FACP hardware is required, include the material and labor necessary to install this hardware.
- D. Do not include cost of conduit or wire or the cost to install conduit or wire except for labor to make final connections at the FACP and at each intelligent addressable device. Do not include the cost of conventional peripherals or the cost of initiating devices or notification appliances connected to the addressable monitor/control modules.
- E. Submittals that do not include this estimate of post contract expansion cost will not be accepted.

PART 2 – PRODUCTS

2.1 EQUIPMENT AND MATERIAL, GENERAL

- A. All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protective signaling system, meeting the National Fire Alarm Code.
- B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.
- C. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.
- D. Fire alarm control panel: The contractor shall furnish and install all FACP accessories needed for the FACP to perform the following.
 - 1. Connect to all initiation and notification circuits shown on plans
 - 2. Network with other FACP's, annunciators, etc.
 - 3. Communicate with remote monitoring station
- E. Refer to plans for manufacturer(s), devices types and models to be used.

2.2 FIRE ALARM CONTROL PANEL (FACP)

- A. All fire alarm systems shall have one main FACP. Systems with more than one FACP will have main FACP indicated on plans. If it is not on plans, it is FACP in administration building.
- B. All satellite FACP's shall include the following equipment:
 - 1. Central processing unit
 - 2. Signaling line circuit (addressable initiation devices) interface(s)
 - 3. Notification appliance circuit interface(s)
 - 4. Network communications module(s)
 - 5. User interface
 - a. 80 character, backlit LCD display
 - b. Buttons
 - 1. Acknowledge
 - 2. Signal Silence

- 3 Drill
- 4 System Reset
- 5 Lamp Test
- c QWERTY keyboard
- 6 Power supply (sized for all loads)
- 7 Battery charger (sized for all loads)
- 8 Batteries (sized for all loads)
- 9 All accessories necessary for a fully functional system
- C The main FACP shall include the following in addition to satellite FACP requirements.
 - 1 User interface
 - a LCD display shall be 640 characters.
 - b Additional buttons
 - 1 Fire Alarm Scroll/Display
 - 2 Security Scroll/Display
 - 3 Supervisory Scroll/Display
 - 4 Trouble Scroll/Display
 - 5 Other Event Scroll/Display
 - 6 Print Screen
 - 7 Next/Previous Section
 - 8 Battery Level
 - c If the fire alarm system has a remote annunciator meeting user interface, the main FACP's user interface may be same as satellite FACP requirements.
 - 2 Digital alarm communicator transmitter
 - 3 Internet Protocol media access card
 - 4 Computer interface software or firmware
- D The FACP and all accessories shall be housed in a cabinet size for all equipment.

2.3 CONDUIT AND WIRE

- A. Conduit
 - 1. Conduit shall be in accordance with The National Electrical Code (NEC), local and state requirements.
 - 2. Where required, all wiring shall be installed in conduit or raceway. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.
 - 3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per NEC Article 760-55.
 - 4. Wiring for 24 volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
 - 5. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.
 - 6. Conduit shall be 3/4-inch (19.1 mm) minimum.
- B. Wires/Cables
 - 1. All fire alarm system wiring shall be new.
 - 2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 12 AWG.
 - 3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.

4. Wire and cable not installed in conduit shall have a fire resistance rating suitable for the installation as indicated in NFPA 70 (e.g., FPLR).
5. Wiring used for the multiplex communication circuit (SLC) shall be twisted and unshielded and support a minimum wiring distance of 12,500 feet. The design of the system shall permit use of IDC and NAC wiring in the same conduit with the SLC communication circuit.
6. All field wiring shall be electrically supervised for open circuit and ground fault.
7. The fire alarm control panel shall be capable of t-tapping Class B (NFPA Style 4) Signaling Line Circuits (SLCs). Systems that do not allow or have restrictions in, for example, the amount of t-taps, length of t-taps etc., are not acceptable.
8. All wires shall be listed by the California State Fire Marshal (CSFM).
- C. Terminal Boxes, Junction Boxes and Cabinets. All boxes and cabinets shall be UL listed for their use and purpose.
- D. Initiating circuits shall be arranged to serve like categories (manual, smoke, waterflow). Mixed category circuitry shall not be permitted except on signaling line circuits connected to intelligent reporting devices.
- E. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod.
- F. All fire alarm cables shall be listed with the California State Fire Marshal for use in a fire alarm system.

2.4 BATTERIES

- A. The battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus 5 minutes of alarm upon a normal AC power failure.
- B. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks for refilling, spills, and leakage shall not be required.
- C. If necessary to meet standby requirements, external battery and charger systems may be used.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.
- B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.
- C. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.
- D. Manual fire alarm boxes shall be suitable for surface mounting or semi-flush mounting as shown on the plans, and shall be installed not less than 42 inches (1067 mm), nor more than 48 inches (122 mm) above the finished floor.

3.2 ON-SITE START-UP

- A. System Check: Prior to energizing any part of this system, the factory authorized representative shall check thoroughly the installation, and perform pre-start checks. This

representative shall check all points, fire alarm panels and complete network to ensure proper operation, and make any needed repairs and/or replacements required. Sufficient time shall be included in the project bid to cover all required start-up assistance and testing.

- B. Testing: The service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment shall be provided to technically supervise and participate during all of the adjustments and tests for the system. All testing shall be in accordance with NFPA 72, Chapter 14.
 - 1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
 - 2. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.
 - 3. Verify activation of all waterflow switches.
 - 4. Open initiating device circuits and verify that the trouble signal actuates.
 - 5. Open and short signaling line circuits and verify that the trouble signal actuates.
 - 6. Open and short notification appliance circuits and verify that trouble signal actuates.
 - 7. Ground all circuits and verify response of trouble signals.
 - 8. Check presence and audibility of tone at all alarm notification devices.
 - 9. Check installation, supervision, and operation of all intelligent smoke detectors using the walk test.
 - 10. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
 - 11. When the system is equipped with optional features, the manufacturer's manual shall be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.
 - 12. The completed smoke detection system shall be tested to insure that it is operating properly. Acceptance of the system shall also require a demonstration of the stability of the system. This shall be adequately demonstrated if the system operates for a ninety (90) day test period without any unwarranted alarms. Should an unwarranted alarm(s) occur, the contractor shall readjust or replace the detector(s) and begin another ninety (90) day test period. As required by the architect, the contractor shall recheck the detectors after each readjustment or replacement of detectors. This test shall not start until the owner has obtained beneficial use of the building under tests.
- C. All test and report costs shall be in the contract price. A checkout report shall be prepared by the installation technicians and submitted in triplicate, one copy of which will be registered with the equipment manufacturer. The report shall include, but not be limited to:
 - 1. A complete list of equipment installed and wired.
 - 2. Indication that all equipment is properly installed and functions and conforms with these specifications.
 - 3. Test of individual zones as applicable.
 - 4. Serial numbers, locations by zone and model number for each installed detector.
 - 5. Voltage (sensitivity) settings for each ionization and photoelectric detector as measured in place with the HVAC system operating.
 - 6. Response time on thermostats and flame detectors (if used).
 - 7. Technician's name, certificate number and date.
 - 8. NFPA Certification shall be completed, signed and submitted.
- D. The completed fire alarm system shall be tested to insure that it is operating properly. Acceptance of the system shall also require a demonstration of the stability of the system. This shall be adequately demonstrated if the system operates for a ninety (90) day test period without any unwarranted alarms. Should an unwarranted alarm(s) occur, the contractor shall readjust or replace the detector(s) and begin another ninety (90) day test period. As required by the architect, the contractor shall recheck the detectors after each

readjustment or replacement of detectors. This test shall not start until the owner has obtained beneficial use of the building under tests.

3.3 FINAL INSPECTION

- A. At the final inspection, a factory-trained representative of the manufacturer of the major equipment shall demonstrate that the system functions properly in every respect.

3.4 INSTRUCTION

- A. Instruction shall be provided as required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.
- B. The contractor and/or the systems manufacturer's representatives shall provide a typewritten "Sequence of Operation."
- C. Appropriate quantities of installation and operation manuals shall be provided and used for instructional purposes.

3.5 RECORD DRAWINGS AND OPERATING MANUALS

- A. After completion of all the tests and adjustments listed above, the contractor shall submit the following information to the architect:
 - 1. "As-built" conduit and cable layout diagrams including wire color code and/or tag number.
 - 2. Complete "as-built" site plans, floor plans, wiring diagrams, and calculations
 - 3. Detailed catalog data on all installed system components.
 - 4. Copy of the test report.
- B. Operating Manual:
 - 1. Before final acceptance of work, the contractors shall deliver five copies of a composite "Operating and Shop Maintenance Manual." Each manual shall contain, but not be limited to: a statement of guarantee including date of installation and name and phone number of the person to be called in the event of equipment failure.
 - 2. Individual factory issued manuals shall contain all technical information on each piece of equipment installed. In the event such manuals are not obtainable from the factory, it shall be the responsibility of the contractor to compile and include them. Advertising brochures or operational instructions shall not be used in lieu of the required technical manuals.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but is not limited to, the following:
 - 1. Clearing and grubbing.
 - 2. Topsoil stripping.
 - 3. Removing above-grade site improvements not indicated elsewhere.
 - 4. Removing below-grade improvements not indicated elsewhere.
 - 5. Disconnecting, capping or sealing, and abandoning site utilities in place.
 - 6. Disconnecting, capping or sealing, and removing site utilities.
 - 7. Temporary erosion- and sedimentation-control measures.
- B. Related Sections include the following:
 - 1. Division 1 Section "Temporary Facilities" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, Storm Water Prevention Plan, and environmental protection measures during site operations.
 - 2. Division 1 Section "Instructions to Bidders" for local permits and waste diversion requirements.
 - 3. Division 1 Section "Storm Water Pollution Prevention Plan" for additional temporary measure requirements not limited to erosion and sedimentation control measures.
 - 4. Division 1 Section "Construction Waste Reduction, Disposal and Recycling" for requirements related to disposal of items from project site.
 - 5. Division 2 Section "Selective Demolition" for partial demolition of site improvements buildings and/or structures undergoing alterations.
 - 6. Division 31 Section "Earthwork" for soil materials, excavating, backfilling, and site grading.

1.3 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch (25 mm) in diameter; and free of weeds, roots, and other deleterious materials.
- B. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- C. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 MATERIALS OWNERSHIP

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- A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.5 SUBMITTALS

- A. Digital photographs sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record drawings according to Division 1 Section "Project Closeout."
 - 1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Salvable Improvements: Carefully remove items to be salvaged and store on Owner's premises where indicated.
- C. Notify utility locator service for area where Project is located before site clearing.
- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control easures are in place.
- E. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
 - 8. Do not direct vehicles or equipment exhaust towards protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

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- A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earthwork."
 - 1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable Architect.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Refer to Best Practices in SWPP Division 1 Section.
- B. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- C. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- D. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- E. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal

3.2 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
 - 1. Arrange to shut off indicated utilities with utility companies or Owner.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than seven days in advance of proposed utility interruptions.

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2. Do not proceed with utility interruptions without Architect's written permission.
- C. Excavate for and remove underground utilities indicated to be removed.

3.3 CLEARING AND GRUBBING

- A. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 1. Place fill material in horizontal layers not exceeding 8-inch (200-mm) loose depth, and compact each layer to a density equal to adjacent original ground.

3.4 TOPSOIL STRIPPING

- A. Remove weeds, sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Limit height of topsoil stockpiles to 60 inches (1500 mm).
 2. Do not stockpile topsoil within drip line of remaining trees.
 3. Dispose of excess topsoil as specified for waste material disposal.

3.5 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs and aggregate base as indicated.
 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

3.6 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 311000

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SECTION 311400 - SOIL MATERIALS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Excavated materials and imported materials.

1.02 RELATED SECTIONS:

- A. Section 31 20 00 – Earthwork: Excavation, Filling, and Grading.
- B. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to the work of this section.

1.03 SUBMITTALS:

- A. Samples: Submit, in air-tight containers, 10 lb. sample of Type B and C fill to the Inspector.
- B. Materials Source: Submit location of imported materials source. Provide materials from same source throughout the work. Change of source requires approval.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS:

- A. Soil Type A: Excavated and reused material, graded, free of roots, lumps greater than one inch, rocks larger than ½ inch, debris, weeds, and foreign matter.
- B. Soil Type B: Imported topsoil, friable loam; reasonably free of roots, rocks larger than ½ inch, debris, weeds, and foreign matter.
- C. Soil Type C: Imported borrow, suitable for purpose intended, free of vegetable matter and other unsatisfactory material, and required as follows:

IMPORTED FILL

Maximum Particle Size (inches)	3"	
Percent Passing #4 sieve		75-100
Percentage Passing #200 sieve	15-40	
Maximum Plasticity Index		15
Minimum "R" Value (pavement area)		greater than 30
Maximum Organic Content		3% by weight
Expansion Index		less than 20

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LOW CORROSION POTENTIAL:

Soluble Sulfates:	<1,500 mg/kg
Soluble Chlorides:	<300 mg/kg
Soil Resistivity:	>3,000 ohm--cm

2.02 SOURCE QUALITY CONTROL:

- A. Inspection of imported soil will be performed as per Section 01 40 00 – Quality Requirements.

PART 3 - EXECUTION

3.01 STOCKPILING:

- A. Stockpile imported material on site at location designated by project Inspector.

3.02 STOCKPILE CLEANUP:

- A. Remove stockpile, grade site surface to prevent freestanding surface water.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but not limited to, the following:
 - 1. Preparing of subgrade and subbase course for building foundations, walks, pavements, granular materials not limited to overexcavation, scarifying, recompaction in maximum 8" lifts and grading.
 - 2. Drainage fill course for support of building slabs.
 - 3. Excavating and backfilling of trenches within building lines.
 - 4. Excavating and backfilling for underground, electrical utilities.
 - 5. All earthwork pertaining to site rough grading including, but not limited to, furnishing all labor and equipment necessary for clearing and grubbing; stripping; preparation of ground surfaces to receive fill; excavation; providing additional backfill soil required to complete project; storm water prevention plan for work being done by this Contractor, filling of voids from site demolition; placement and compaction of structural and non-structural fill; disposal of excess materials and products of clearing, grubbing, and stripping; and any other work necessary to the project construction documents and required to complete project.
 - 6. Continuous dust palliation throughout Earthwork.
 - 7. $\frac{3}{4}$ " cleaned crushed gravel at yard boxes, valve boxes, pull boxes and similar locations.
 - 8. Subsurface drainage backfill for walls and trenches.
- B. The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Temporary Facilities" for dust palliation additional requirements.
 - 2. Division 1 Section "Construction Waste Reduction, Disposal and Recycling" for requirements for disposal and recycling of earthwork related items and required herein.
 - 3. Division 1 Section "Storm Water Prevention Plan" for requirements erosion and sediment control during earthwork operations and requirements herein.
 - 4. Division 31 Section "Site Clearing" for site stripping, grubbing, topsoil removal and tree protection.
 - 5. Division 32 Section "Hot Mixed Asphalt Paving" for items requiring preparation of base, subbase and additional items.

1.3 DEFINITIONS

- A. Excavation consists of removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.
 - 1. Excavation shall be defined within the content of these Specifications as earth material excavated for the purpose of constructing fill embankment; grading the site to elevations shown on project Plans; or placing underground pipelines, conduits, or other subsurface

utilities or minor structures.

- B. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be at Contractor's expense.
1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Architect and proposed products and mix design is approved.
 2. In locations other than those above, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Architect.
- C. Additional Excavation: When excavation has reached required subgrade elevations, notify Soils Engineer, who will observe exposed conditions. If Soils Engineer determines that bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as recommended by Soils Engineer.
- D. "Subgrade" or "Subbase": The undisturbed earth or the compacted soil layer immediately below granular subbase, compacted base, recompacted base, drainage fill, footings, walkways and/or topsoil materials. Refer to requirements herein and drawings for compaction of subbase material and scarifying requirements.
- E. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.
- F. Engineered Fill: Engineering fill shall be construed within the body of these Specifications as soil or approved soil-rock mixtures placed to raise the grades of the site or to backfill excavations and upon which the Soil Engineer has performed sufficient tests and has made sufficient observation during placement to enable soil engineer to issue a written statement confirming substantial conformance of the work to project earthwork specifications.
- G. On-Site Material: On-site material is earth material obtained in excavation made on the project site. Contractor shall confirm if adequate materials are available for backfill operations in the event not enough materials are available on site this Contractor shall provide additional soils materials to complete this project.
- H. Imported Material: Imported materials are earth material obtained off the site, hauled in, and placed as fill.
- I. "Compaction" or "Compacted": Wherever expressed or implied within the context of these Specifications and/or drawings shall be interpreted as to scarify undisturbed soil eight (8) inches and compacted to ninety (90) percent maximum dry density or as noted herein or drawings. Dry density shall be obtainable by ASTM Test Method D-1557-91 (Method A).
- J. "Recompaction" or "Recompact": Wherever expressed or implied within the context of these Specifications and/or drawings shall be interpreted as to removed soil, overexcavation, below top of the finish cover material regardless of the cover material if any, a minimum of twelve inches (12") or as more restrictively indicated herein or drawings. A minimum of 12", unless noted more restrictively herein or drawings, of soil shall be removed and sub base scarified eight (8) inches and compacted to ninety (90) percent maximum dry density or as noted herein or drawings then approved base material shall be placed in 8" maximum lifts and be compacted to ninety (90)

percent maximum dry density or as noted herein or drawings. Dry density shall be obtainable by ASTM Test Method D-1557-91 (Method A).

- K. Grading Plane: The grading plane is the surface of the base material upon which the lowest layer of subbase, base, pavement, surfacing, or other specified layer, is placed.
- L. A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- M. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving or related top finish material.
- N. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- O. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- P. Base: Base material is the material directly under finish cover material(s) not limited to AC paving, concrete, pavers, grindings, landscape top soil and related items. Base material shall be placed and compacted as indicated herein or drawings. Recompacted base shall be defined as removal of base material, overexcavation, and replacement in recompacted lifts as indicated herein.

1.4 SUBMITTALS

- A. Product Data: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
 - 1. Product data for the following:
 - a. Plastic Warning tape - each type.
- B. Samples for Verification: For the following products, in sizes indicated below:
 - 1. Warning Tape: 12 inches (300 mm) long; of each color.
- C. Informational Submittals:
 - 1. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 QUALITY ASSURANCE

- A. Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
- B. Testing and Inspection Service: Owner will employ and pay for a qualified independent geotechnical testing and inspection laboratory to perform observations soil testing service during earthwork operations.

- C. Performance: It shall be the responsibility of the Contractor to complete all earthwork in accordance with project Plans and Specifications. No variance from Plans and Specifications shall be permitted without written approval of the Soil Engineer or his designated representative, hereinafter referred to as the "Soil Engineer". Earthwork shall not be considered complete until the "Soil Engineer" has issued a written statement confirming substantial compliance of earthwork operations to these Specification and to project Plans.
- D. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."
 - 1. Before commencing earthwork, schedule a meeting, Owner, Architect, consultants, Soils Engineer, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least seven (7) working days prior to convening meeting. Contractor shall record discussions and agreements and furnish a copy to each participant.

1.6 PROJECT CONDITIONS

- A. Site Conditions:
 - 1. The Contractor shall visit the site, prior to bid submittal, to determine existing soil and topographic conditions, and the nature of materials that may be encountered during the course of the work under this contract. Contractor shall make allowances for differences in existing soil and topographic conditions if different than indicated in Contract Documents.
 - 2. The Contractor shall assume all liability under the Contract for any loss sustained as a result of variations which may exist between assumed conditions and actual conditions. Contractor shall verify moisture, site soil shrinkage/expansion, and rock loss content of soils prior to bidding and make allowances for condition of soil during Earthwork operations and allow for seasonal conditions known to this area. Contractor shall allow for providing additional soils for backfill and related work due to not enough adequate/specified soils on-site for backfill/fill operations to complete project.
 - 3. Material to be excavated is assumed to be earth or other materials which can be removed by power earth-moving equipment, including rippers. If "rock", as hereinafter defined is encountered within the limits of excavation, the Contract Price will be adjusted as provided for in the General Conditions. "Rock" is defined as fresh, hard consolidated stone or boulders in pieces (indicated in 3.9.B), which cannot be ripped and requires the use of air hammer or blasting removal.
 - 4. Site has a minimum of 10% loss for rocks that exceed the size for re-use as fill. Remove from job site non-conforming materials.
- B. Site Information: Data in subsurface investigation reports was used for the basis of the design and are available to the Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. The Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.
 - 1. Preliminary Soil Investigation prepared for this project shall be included as if part of this document by reference.
 - a. Copy in Project Manual.
 - 2. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.
 - 3. Contractor shall comply with requirements of preliminary soils investigation. In the event

- of a conflict with construction documents and preliminary soils investigation, the more restrictive requirements shall prevail.
4. Alternative methods other than items prescribed herein, shall be approved in writing by Architect, Structural Engineer, DSA and Geotechnical Engineer. Submit substitution a minimum of 60 days prior to a activity to allow for processing and approvals.
- C. Existing Utilities: Locate existing underground utilities in areas of excavation work and surrounding 50 foot beyond. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 2. Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Architect and then only after acceptable temporary utility services have been provided.
 - a. Provide minimum of 72-hour notice to Architect, and receive written notice to proceed before interrupting any utility.
 3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies/owner for shutoff of services if lines are active.
- D. Use of Explosives: Use of explosives is not permitted.
- E. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
1. Operate warning lights as recommended by authorities having jurisdiction.
 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 3. Perform excavation by hand within dripline of large trees to remain. Protect root systems from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.
- F. Responsibility: The Contractor shall assume sole responsibility for job site conditions during the course of earthwork operations on the project, including safety of all persons and preservation of all property; this requirement shall apply continuously and not be limited to normal working hours. The Contractor shall defend, indemnify, and hold harmless the Owners, Architect, Engineer, and Soils Engineer from any and all liability and claims, real or alleged, arising out of performance of earthwork on this Project, except from liability incurred through sole negligence of the Owner, Architect, Engineers or Soils Engineers.
- G. All equipment shall be maintained in proper working order and tuned to manufacturer's written specification to reduce emissions.
- H. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
1. Do not close or obstruct on site and off site streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or

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- authorities having jurisdiction.
- 3. Do not use surface roadways and site access points used by students and public unless approved by Owner and times of use coordinated with Owner site occupancy.
- I. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.
- J. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified herein are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP and SM; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
 - 1. Screened materials obtained from on-site excavations will be considered satisfactory for construction of on-site engineered fills. If unexpected pockets of poor or weak materials are encountered in excavations, and they cannot be up-graded by mixing with other materials or by other means, they may be rejected by the Soils Engineer for use in engineered fill.
 - 2. When imported fill materials are necessary to bring the site up to planned grades, no material shall be imported prior to its approval and acceptance by the Soils Engineer.
 - a. These materials shall have a maximum soluble sulfate content of 2000 ppm and a maximum soluble chloride content of 200 ppm according to California Department of Transportation Test Methods 417 and 422 respectively.
- B. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- C. Sub-Base/Base Material: Class 2 Aggregate Base - 3/4", as defined by Cal Trans Specification 26. Class 2 aggregate sub-base, as defined by Cal Trans Specification Section 25.
- D. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 8 sieve.
- E. Backfill and Fill Materials: Satisfactory soil materials free of clay, debris, waste, frozen materials, vegetation, other deleterious matter, and rock or gravel per the following.
 - 1. Where rock or gravel exceeds 1", provide 12" sand cushion in trenches as protective layer above pipes and conduit. See plans for trench detail for sand bed.
 - 2. Utilizing on-site excavated material meeting the above requirements, the maximum size material recommended for use as on-site fill is two (2) inches. The maximum size material for imported soil is two (2) inches. A minimum of one (1) foot below the finish subgrade should be free of material greater than one (1) inch.

3. Larger rocks and cobbles not in excess of 2" in the greatest dimension maybe incorporated into the lower 3' portion of the fill provided individual rock and cobble units are properly dispensed in the fill matrix (as verified during grading by the Soils Engineer). Where trenches for utilities are in lower 3' portion, provide for equipment to facilitate trenching.
- F. Sand: Natural sand, manufactured sand, existing native material or combinations shall conform to the following: Clean, free of organic impurities meeting ASTM C-40, gradation meeting ASTM C-136 & C-117, free of undesirable clay meeting ASTM D-2419. Used blasting abrasives shall not be used.
- G. Top Soil: If required, imported topsoil shall be natural, fertile, friable loam, capable of sustaining vigorous plant growth, free of subsoil, roots, grass, excessive amount of weed, stone and foreign matter; acidity range of pH 5.5 to 7.5; containing a minimum of 4% and a maximum of 25% organic matter. Obtain approval of the Landscape Architect or Authorized representative for placement. The contractor is to submit a topsoil sample to an approved testing lab for a complete fertility assay for approval prior to importing the material on-site.
- H. Gravel: $\frac{3}{4}$ " clean crushed gravel. No deleterious materials.

2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.
 1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.
- B. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick minimum, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 2'-6" deep.
 1. Red: Electric.
 2. Yellow: Gas, oil, steam and dangerous materials.
 3. Orange: Data, telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.

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- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 CLEARING AND GRUBBING

- A. Clearing and grubbing shall consist of removing all debris such as metal, broken concrete, trash, vegetation growth and other biodegradable substances, from all areas to be graded. Existing obstructions below shall be removed in accordance with the procedures indicated herein.

3.3 EXISTING SLABS AND PAVEMENTS

- A. Shall be completely removed. Existing on site Portland cement, or concrete fragments may be used in engineered fills provided they are broken down to a maximum dimension of two (2.0) inches and thoroughly dispersed within a friable soil matrix. Engineered fill containing said fragments should not be placed above the elevation of the bottom of the lowest structure footing. No asphalt concrete shall be allowed in on-site fill.

3.4 EXISTING FOUNDATIONS

- A. Foundations existing at the time of grading shall be removed.

3.5 EXISTING BURIED UTILITIES

- A. Buried utilities such as sewer, water and gas lines or electrical conduits to remain in service shall be re-routed to pass no closer than four (4.0) feet to the outside edge of proposed exterior footings of structures. Lines to be abandoned shall be completely removed below finished building pad grade, unless noted to be removed entirely wherever found.

3.6 CAVITIES

- A. Cavities resulting from clearing and grubbing or cavities existing on the site as a result of man-made or natural activity shall be backfilled with earth materials placed and compacted in accordance with these Specifications.

3.7 PRESERVATION OF MONUMENTS, CONSTRUCTION STAKES, PROPERTY CORNER STAKES

- A. Preservation of monuments, construction stakes, property corner stakes, or other temporary or permanent horizontal or vertical control reference pints shall be the responsibility of the Contractor. Where these markers are disturbed, they shall be replaced at the Contractor's expense.

3.8 EXCAVATION

- A. Excavations shall be cut to elevations plus or minus 0.1 foot of the grades shown on the accepted Plans.
 - 1. When excavated materials are to be used in engineered fill, the excavation shall be made in a manner to produce as much mixing of the excavated materials as practicable.

2. When excavations are to be backfilled, and where surfaces exposed by excavation are to support structures or concrete floor slabs, the exposed surfaces shall be scarified to a depth of 8", moistened and compacted, as stated above for areas to receive fill. Over excavation below specified depths will not eliminate the requirement for exposed surface compaction.
- B. Excavation Classifications: The following classifications of excavation will be made when rock is encountered:
1. Earth Excavation includes excavation of pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.
 2. Rock excavation for trenches and pits includes removal and disposal of materials and obstructions encountered that cannot be excavated with a track-mounted power excavator, equivalent to Caterpillar Model No. 215C LC, and rated at not less than 115 HP flywheel power and 32,000-pound drawbar pull and equipped with a short stick and a 42-inch wide, short tip radius rock bucket rated at 0.81 cubic yard (heaped) capacity. Trenches in excess of 10 feet in width and pits in excess of 30 feet in either length or width are classified as open excavation.
 3. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered that cannot be dislodged and excavated with modern, track-mounted, heavy-duty excavating equipment without drilling, blasting, or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or equivalent track-mounted loader, rated at not less than 210 HP flywheel power and developing minimum of 45,000-pound breakout force (measured in accordance with SAE J732).
 - a. Typical of materials classified as rock are boulders 1/2 cu. yd. or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits.
 - b. Intermittent drilling, or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.
- C. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by Architect or his representative.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Architect and Structural Engineer.
1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect and Structural Engineer with no additional costs to project.

3.10 STABILITY OF EXCAVATIONS

- A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.
- B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

- C. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.

3.11 STORAGE OF EXCAVATED MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill where directed. Place, grade, and shape stockpiles for proper drainage.
 - 1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
 - 2. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill offsite.
 - 3. Relocate excavated materials to location as required to mix and work to make acceptable. Owner shall approve location prior to starting this Work.

3.12 EXCAVATION FOR WALKS, GRANULAR PAVING AND PAVEMENTS

- A. Excavate surface under walks, granular paving and pavements to comply with elevations and grades as indicated--note minimums indicated herein, drawings and/or details including overexcavation requirements. A minimum of 12" overexcavation is required, unless noted more restrictively herein or drawings, of soil shall be removed and sub base scarified eight (8) inches and compacted to ninety (90) percent maximum dry density or as noted herein or drawings then approved base material shall be placed in 8" maximum lifts and be compacted to ninety (90) percent maximum dry density or as noted herein or drawings. Dry density shall be obtainable by ASTM Test Method D-1557-91 (Method A).

3.13 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to uniform width, sufficiently wide to provide ample working room and a minimum of 6 to 9 inches of clearance on both sides of pipe or conduit. Excavate trench walls vertically from trench bottom to 24" minimum higher than top of pipe or conduit, see schedule construction documents for more restrictive requirements.
- B. Excavate trenches for conduit and utilities to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on bedding course.
 - 1. Where rock is encountered, carry excavation 6 inches below required elevation and backfill with a 6-inch layer of crushed stone or gravel prior to installation of pipe.
 - 2. For pipes or conduit less than 6 inches in nominal size, and for flat-bottomed, multiple-duct conduit units, do not excavate beyond indicated depths. Hand-excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
 - 3. For pipes and equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for 90 degrees (bottom 1/4 of the circumference). Fill depressions with tamped sand backfill. At each pipe joint, dig bell holes to relieve pipe bell of loads. Ensure continuous bearing of pipe barrel on bearing surface.

3.14 BACKFILL AND FILL

- A. General: Place soil material in layers to required subgrade elevations, for each area classification listed below, using materials specified in Part 2 of this Section.
1. Under planting areas, use satisfactory excavated or on site materials treated or imported approved top soil.
 2. Under walks, granular paving, base material and pavements, use subbase material, satisfactory excavated or borrow material, or a combination.
 3. Under steps, use subbase site material.
 4. Under building slabs, use sub-base material.
 5. Under piping and conduit and equipment, use subbase materials where required over rock bearing surface and for correction of unauthorized excavation. Shape excavation bottom to fit bottom 90 degrees of cylinder.
 6. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and that are carried below bottom of such footings or that pass under wall footings. Place concrete to level of bottom of adjacent footing.
 - a. Concrete is specified in Division 3.
 - b. Do not backfill trenches until tests and inspections have been made and backfilling is authorized by Architect. Use care in backfilling to avoid damage or displacement of pipe systems.
 7. Provide 4-inch-thick concrete base slab support for piping or conduit less than 2'-6" below surface of roadways. After installation and testing of piping or conduit, provide minimum 4-inch-thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.

3.15 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints and barrels of pipes and for joints, fittings and bodies of conduits.
- B. Place and compact initial backfill of sand to a height of 12 inches over the utility pipe or conduit.
1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
 2. Compaction of pipe zone and trench backfill material should be in accordance with requirements herein. Outside building areas and pavement/walkway subgrade, the minimum relative compaction should be 90 percent, see details on plans.
- C. Coordinate backfilling with utilities testing.
- D. Fill voids with approved backfill materials as shoring and bracing, and sheeting is removed.
- E. Place and compact final backfill of satisfactory soil material to final subgrade.
- F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
1. Provide detectable warning tape for all utility lines except electrical /sign.
 2. Provide non-detectable warning tape for all electrical/signal lines.

3.16 FILL MATERIALS

- A. The Soils Engineer shall be given notice of the proposed source of imported materials with adequate time allowance for his testing of the proposed materials. The time required for testing will vary with different types of materials, job conditions, and ultimate function of filled areas. Under best conditions, the time requirement will not be less than 7 days.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
 - 1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 - 2. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.
 - 3. Removal of concrete formwork.
 - 4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required and allowed by Soils Engineer, Architect, Engineer, and DSA.
 - 5. Removal of trash and debris from excavation.
 - 6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

3.17 PLACEMENT AND COMPACTION

- A. Surfaces to receive fill shall be scarified to a depth of at least eight (8.0) inches, until the surface is free from ruts, hammocks or other uneven features which would tend to prevent uniform compaction by the equipment to be used.
- B. After the area to receive fill has been cleared and scarified, it shall be moistened and compacted to a depth of at least eight (8.0) inches in accordance with specifications for compacting fill material.
- C. The fill material shall be placed in layers which, when compacted, shall not exceed eight (8.0) inches in thickness. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to insure uniformity of material in each layer. Increased thickness of layers may be approved by the Soils Engineer when conditions warrant.
- D. All fills shall be placed in level layers; layers shall be continuous over the area of any structural unit, and all portions of the fill shall be brought up simultaneously within the area of any structural unit. When imported material is used, it must be placed so that its thickness is as uniform as possible within the area of any structural unit.
- E. When materials are to be excavated and replaced in a compacted or recompacted condition, segmented, or leap frogging of cut fill operation within the area of any structural unit will not be permitted unless the method is specifically described by the Soils Engineer.
- F. When the moisture content of fill material is below the lower limit specified by the Soils Engineer, water shall be added until the moisture content is as specified; and when it is above the upper limit specified; the material shall be aerated by blading or other satisfactory methods until the moisture content is as specified.
- G. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to not less than ninety (90) percent of maximum density in accordance with ASTM Density Test

Method D1557-91. Compaction shall be by equipment of such design that it will be able to compact the fill to specified density. When the Soils Engineer specifies a specific type of compaction equipment to be used, such equipment shall be used as specified.

- H. Recomposition and compaction of each layer shall be continuous over its entire area and the equipment shall make sufficient trips to insure that the desired density has been obtained.
- I. Field density tests shall be made by the Soils Engineer. The compaction of each layer of fill shall be subject to testing. Where sheepfoot rollers are used, the soil may be disturbed to a depth of several inches. Density tests shall be taken in the compacted material below the disturbed surface. When tests indicate the density of any layer of fill or portion thereof is below the required ninety (90) percent density, the particular layer or portion shall be reworked until the required density has been obtained.
- J. When specified compaction to other standards or to percentages other than ninety (90) percent, such specification, with respect to the particular items shall supersede these specifications.
- K. The fill operation shall be continued in eight (8.0) inches compacted layers, as specified above, until the fill has been brought to within 0.1 foot, plus or minus the finished slopes and grades, as shown on the accepted Plans. The finished surface of fill areas shall be graded or bladed to a smooth and uniform surface and no loose material shall be left on the surface.
- L. No fill material shall be placed, spread, or compacted while it is frozen or thawing or during unfavorable weather conditions. When work is interrupted by weather conditions, fill operations shall not be resumed until the Soils Engineer indicates that moisture content and density of previously placed fill are satisfactory.
- M. Control soil and fill compaction, providing minimum percentage of density specified for each area classification indicated below. Correct improperly compacted areas or lifts as directed by Architect if soil density tests indicate inadequate compaction.
 - 1. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following minimum (see tolerances) percentages of maximum density, in accordance with ASTM D 1557:
 - a. Under structures, building slabs and steps, overexcavate base minimum 12", unless noted more herein or on drawings, scarify exposed soil sub base 8", compact sub base to 90 percent relative density. Recompact base material in 8" maximum lifts to at 90 percent maximum dry density, tolerance +/- 5%.
 - b. Under planting areas or unpaved areas, compact top 12 inches of subgrade and each layer of backfill or fill material at 75 percent maximum dry density.
 - c. Under walkways, overexcavate base minimum 12", unless noted more herein or on drawings, scarify exposed soil sub base 8", compact sub base to 90 percent relative density. Recompact base material in 8" maximum lifts to at 90 percent maximum dry density, tolerance +/- 5%.
 - d. Under granular paving and asphaltic pavement, overexcavate base minimum 12", unless noted more herein or on drawings, scarify exposed soil sub base 8", compact sub base to 90 percent relative density. Recompact base material in 8" maximum lifts to 90 percent relative density.
 - e. Refer to drawing for more restrictive requirements.
 - 2. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.

- a. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
- b. Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value to continue earthwork.

3.18 GRADING

- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and as follows:
 1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
 2. Walks: Shape surface of areas under walks to line, grade, and cross-section, with finish surface not more than 0.10 foot above or below required subgrade elevation.
 3. Pavements: Shape surface of areas under pavement to line, grade, and cross-section, with finish surface not more than 1/2 inch above or below required subgrade elevation.
- C. Grading Surface of Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2 inch when tested with a 10-foot straightedge.
- D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.19 PAVEMENT SUBBASE COURSE

- A. General: Subbase course consists of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course of Class 2 aggregate base.
 1. Refer to other Division 32 sections for paving materials specifications.
- B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.

3.20 FIELD QUALITY CONTROL

- A. Quality Control Testing During Construction: Allow testing service to inspect and approve each subgrade and fill layer before further backfill or construction work is performed.
 1. The Soils Engineer shall be provided with a 72-hour advance notice, in order that he may be present at the site during all earthwork activities related to excavation, tree root removal, stripping, rock removal, backfill and compaction and filling of the site and to perform periodic compaction tests so that substantial conformance to these recommendations can be established.

3.21 EROSION CONTROL

- A. It shall be the responsibility of the Contractor to prevent erosion of the freshly graded area during construction and until such time as permanent drainage and erosion control measures have been installed.
- B. Provide erosion control methods in accordance with requirements of authorities having jurisdiction.

3.22 MAINTENANCE

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
- D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.
- E. Finish grades shall be maintained such that a minimum two (2) percent drainage gradient is maintained away from all structures and that water is not allowed to pond in structural fill areas.

3.23 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Remove excess excavated material, trash, debris, and waste materials and dispose of it off Owner's property.
- B. Dust Palliation: During all earthwork operations, water shall be applied to the ground surface at frequent intervals, and in sufficient quantities to lay the dust.
- C. Public Property: Where excavations extend outside the property lines into public property areas, conform to the requirements of the governing authorities, in the event these specification conflict with requirements of governing authority the more restrictive/higher quality/quantity shall prevail.

3.24 CONTINUOUS DUST PALLIATION

- A. Light sprinkling of earthwork areas is required continuously to reduce airborne dust.
 - 1. Due to project site having increased soil collapsibility, sprinkling shall be done with only 20% of normal water amount. Increase frequency of sprinkling to accommodate the lesser amount.

END OF SECTION 312000

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SECTION 31 23 00 - TRENCH EXCAVATION BACKFILL

PART 1 - GENERAL

1.01 SECTION INCLUDED:

- A. Excavating trenches, holes, and pits for constructing the work.
- B. Backfilling and compaction pipeline or underground structure from bedding to subgrade or finish grade elevations.

1.02 RELATED SECTIONS:

- A. Section 31 14 00 – Soil Materials.
- B. Section 31 20 00 – Earthwork: Excavation, Filling, and Grading.
- C. Section 33 10 00 – Site Water Systems
- D. Section 33 30 00 – Site Sewer Systems
- E. Section 33 40 00 – Site Storm Drainage Systems
- F. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to the work of this section.

1.03 REFERENCES:

- A. ASTM D 1557.

1.04 COORDINATION:

- A. Coordinate work with Owner personnel.
- B. Verify that the location of existing utilities have been indicated at work site by Owner personnel.

1.05 EXISTING UTILITIES:

- A. The Engineer has indicated on the plans the location of all known existing utility facilities within the work area. The location of said facilities shall be considered approximate only, until exposed by the Contractor.
- B. Service laterals have been shown where information was available. The location of said facilities shall be considered approximate only, until exposed by the Contractor.
- C. Contractor shall verify all utilities within the work area, including using hand method. Contractor shall protect all existing utilities not designated to be removed.
- D. Maintain all existing utility mains and service lines in constant service during construction of the work.

PART 2 - PRODUCTS

2.01 FILL MATERIALS:

- A. Backfill with native, suitable materials.

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PART 3 - EXECUTION

3.01 REPARATION:

- A. Protect all improvements not authorized for removal.
- B. Maintain and protect above and below grade utilities to remain.
- C. Comply with all provisions of the Construction Safety Orders and General Safety Orders of the California Division of Industrial Safety, as well as all other applicable regulations as they pertain to the protection of workers from the hazard of caving ground in excavations.

3.02 EXCAVATION:

- A. Excavate soil required to locate existing utilities and install the work, use hand method as necessary in congested area.
- B. Employ equipment and methods appropriate to the work site.
- C. Cut trenches just wide enough to enable installation and proper backfill and do not interfere with 45 degree bearing splay of foundations. When excavating through tree roots, cut roots by hand.
- D. Excavate trenches to provide the minimum cover required.
- E. Excavate trenches, pits, or holes bottoming in hardpan to a minimum of 6 inches below the grade for the bottom of the pipe and any couplings.
- F. In all trenches or excavation sites where a firm foundation is not encountered, such as soft, spongy, or otherwise unsuitable material, remove the material to a minimum of 12 inches, or to a depth determined by the Engineer, below the bottom of the proposed pipe or structure.
- G. Stockpile excavated material to be returned to trench adjacent thereto in location, which will not be detrimental to existing improvements, or pedestrian or vehicular traffic. Remove unsuitable or excess materials not being used, from site and legally dispose of material.

3.03 BACKFILLING:

- A. Backfill from bottom of the trench to pipe grade with Type B and C soil.
- B. After installation of pipes and appurtenances then backfill of pipe with bedding material.
- C. Backfill trenches above pipe bedding material and to within 6 inches of finish subgrade with Type A, B, & C soils. Compact all soil backfill not exceeding 8 inches in uncompacted thickness. Maintain optimum moisture content of fill materials.
- D. Backfill final 6 inch thickness to finish subgrade in areas to receive concrete, asphalt-concrete, aggregate base, or other non-vegetative surface improvement, with Type B or C soils.
- E. Backfill final 6 inch thickness to finish subgrade in areas to receive sod, other vegetation, or bare soil with Type A soil.
- F. Obtain 85 percent relative compaction of backfill from bottom of backfill to a level of 2 feet below finish subgrade, and obtain minimum of 95 percent relative compaction of backfill in top 2 feet below finish subgrade, in areas to receive concrete, asphalt-concrete, aggregate base, or other non-vegetative surface improvement.

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- G. Obtain minimum of 85 percent relative compaction of backfill in areas to receive sod, other vegetation, or bare soil.

3.04 TOLERANCES:

- A. Top surface of Backfilling Under Paved or Concrete Areas: Plus or minus 0.05 feet from required elevations.
- B. Top Surface of General Backfilling: As required surface to match adjacent improvements or ground.

3.05 FIELD QUALITY CONTROL:

- A. Field inspection and testing will be performed under provisions of Section 01 40 00 – Quality Requirements.
- B. Compaction testing will be performed in accordance with ASTM D 1557.
- C. If tests indicate work does not meet specified requirements, recompact, and retest.

3.06 PROGRESS AND PROSECUTION:

- A. Backfill any excavation opened in any day on that same day.

END OF SECTION

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SECTION 312500 - STORM WATER POLLUTION PREVENTION PLAN

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes the following:

1. Provide all material, labor, equipment and services necessary to implement and inspect the Storm Water Pollution Prevention Plan (SWPPP).
2. Provide all material, labor, equipment and services necessary to comply with the conditions of the Construction General Permit (CGP) No. 2009-0009-DWQ.
3. Implement the Best Management Practices (BMP) contained within the SWPPP or implement other practices deemed necessary by the Contractor/Qualified SWPPP Practitioner (QSP) to better accomplish the intent of controlling the quality of runoff water from the Project Site.
4. Submit to the Owner/LRP all reports required for the Annual Report prior to September 1 of each year

B. This Section does not include:

1. The Owner's Qualified SWPPP Developer (QSD) will prepare the SWPPP.
2. A Notice of Intent (NOI) to be covered by the CGP will be electronically filed by the Owner/Legally Responsible Person (LRP) with the State Water Resources Control Board (SWRCB). The Owner/LRP will pay the NOI fee and annual fees thereafter when applicable.
3. If applicable, an Erosivity Waiver will be electronically filed by the Owner/LRP with the SWRCB. The Owner/LRP will pay the Erosivity Waiver fee.
4. The Annual Report will be electronically filed by the Owner/LRP with the SWRCB by September 1 of each year.
5. A Notice of Termination (NOT) to terminate the CGP coverage will be electronically filed by the Owner/LRP with the SWRCB at the end of the project upon final stabilization as determined by the owner's QSD.

C. Related Sections: The following Project Manual Sections contain requirements that relate to this section:

1. ALL DIVISION 00 SPECIFICATION SECTIONS.
2. ALL DIVISION 01 SPECIFICATION SECTIONS.
3. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
4. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

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1.02 DEFINITIONS

A. Acronyms:

BMP	Best Management Practices
CARB	California Air Resources Board
CGP	Construction General Permit Order No. 2009-0009-DWQ
CSMP	Construction Site Monitoring Program
EPA	Environmental Protection Agency
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollution Discharge Elimination System
QSD	Qualified SWPPP Developer
QSP	Qualified SWPPP Practitioner
SJVAPCD	San Joaquin Valley Air Pollution Control District
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
RWQCB	Regional Water Quality Control Board

1.03 SUBMITTALS:

A. Submit in accordance with Specification Section – 01 33 00.

1. Addenda to the SWPPP.
2. Reports required by the SWPPP.

1.04 QUALITY ASSURANCE:

B. Regulatory Requirements:

1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
 - a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.
 - b. EPA Environmental Protection Agency
 - c. SWRCB State Water Resources Control Board
 - d. RWQCB Regional Water Quality Control Board
 - e. SJVAPCD San Joaquin Valley Air Pollution Control District

PART 2: PRODUCTS

2.01 SOURCE QUALITY CONTROL:

A. Storm Water Pollution Prevention Plan (SWPPP):

1. The Owner shall prepare the SWPPP and obtain the CGP.
2. The intent of the CGP is to protect the quality of receiving waters of the United States by limiting the quantity of pollutants in rainfall runoff from construction

sites of one acre or more in area. In order to accomplish this goal, each construction project is required to prepare a SWPPP that will govern construction activities to lessen the probability that pollutants will be present in rainfall runoff from their site.

3. This site will be covered by the CGP by the time construction begins.
 - a. All construction activity must comply with the conditions of the CGP.
 - b. A NOI to be covered by the CGP will be filed by the Owner/LRP with the SWRCB and the fees will be paid by the Owner/LRP. Contractor shall provide all necessary material (SWPPP) to the Owner to be included for CGP applications.
 - c. Copies of the NOI will be provided to the Contractor to place in the appropriate Appendix of the SWPPP when the NOI is available.
4. The BMPs contained in the SWPPP will meet the intent of the CGP.
 - a. The Owner does not have any responsibility for selecting or implementing the BMPs proposed by the Contractor and QSP to adequately control the quality of runoff from the site.
 - b. The Contractor and QSP must provide, implement, and carry out the BMPs that comply with the CGP regardless of the BMPs contained in the SWPPP.
 - c. The Contractor and QSP shall bear full responsibility for reviewing the proposed BMPs, ascertaining their ability to provide adequate controls, and implementing the BMPs or implementing others deemed by the Contractor and QSP to better accomplish the intent of controlling the quality of runoff water from the project site.

PART 3: EXECUTION

3.01 APPLICATION:

A. General Requirements:

1. The Contractor shall comply with the conditions of the CGP. The CGP is available at the following website:

www.waterboards.ca.gov/waterissues/programs/stormwater/constpermits.shtml
2. The SWPPP is an aid to the Contractor in complying with the CGP.
3. Under the terms of this Contract, the Contractor is the Operator/Discharger of the Project Site. It is the Contractor's and QSP's responsibility to faithfully and fully implement the BMPs contained in the SWPPP, and other BMPs as required to effectively control the quality of runoff water from the project site.
4. The Contractor shall fully and completely carry out all provisions of the SWPPP and insure that all of the Contractor's forces, including sub-contractors, on the site do the same. The Contractor shall assume full responsibility for the implementation, maintenance and execution of the SWPPP for the life of this

project. The Contractor shall be fully liable for penalties, fines, and clean-up costs resulting from the failure of the Contractor's personnel or subcontractor's personnel to comply with the provisions of the SWPPP, and hold the Owner/LRP harmless from the Contractor's failure to implement the SWPPP as required by the SWRCB, RWQCB, CGP, and the local authority having jurisdiction.

5. The Contractor shall be fully aware of the requirements for the full execution of the SWPPP which are contained in the previously mentioned regulations, the requirements of these specifications for implementing, maintaining, and enforcing the provisions of the SWPPP and the impact that the SWPPP will have on the operation, prosecution and cost of the work. A submittal of a bid on this project will be considered as prima facie evidence that the Contractor fully comprehends these requirements and impacts and has fully allowed for their effect on this project, both in time and cost.

B. Best Management Practices (BMPs):

1. The Contractor's QSP shall conduct inspections weekly and at least once each 24-hour period during extended storm events, to identify and record BMPs that need installation or maintenance to operate effectively. Should the QSP deem the BMPs proposed in the SWPPP are inadequate to meet the requirements of the CGP, or a change occurs in the nature or manner of construction operations not anticipated in the SWPPP, the QSP shall propose alternative BMPs that are equal to or better than those contained in the SWPPP.
2. Should the Contractor implement alternative BMPs, he shall prepare all addenda to the SWPPP required by the CGP and notify the Owner's QSD for review of amendments to the original SWPPP.
3. Failure to implement the BMPs as required to meet the intent of the CGP and the SWPPP is a breach of state and federal laws. Punishment for breaking the law can result in fines and imprisonment.
4. BMPs shall be maintained from the start of construction until final stabilization.

3.02 FIELD QUALITY CONTROL:

A. Monitoring of BMPs

1. Monitoring by Contractor's QSP
 - a. Implement the CSMP (weekly, pre-storm, storm event, post-storm, quarterly inspections) as required by the CGP.
 - b. Conduct training and testing as required by the CGP.
 - c. Prepare and submit all reports to Owner/LRP and SWRCB as required by the SWPPP and the CGP. The Contractor is advised that the electronic filing of the Annual Report with the SWRCB by the Owner/LRP on behalf of the Contractor does not relieve the Contractor of any responsibility due to his failure to conduct proper inspection, testing, and training as required by the CGP. The Contractor shall bear full liability arising out of failure to conduct the required inspections, training, and testing detailed in the CSMP in the SWPPP.
2. Monitoring by Owner

- a. The Owner will monitor the Contractor's implementation and maintenance of the BMPs.
 - b. Should the Owner determine that the Contractor's efforts fail to meet the requirements of the CGP, the SWPPP, and SWPPP amendments, the Owner reserves the right to employ any and/or all of the following actions:
 - a. Notify the SWRCB of the perceived failure of the Contractor to comply with the CGP and SWPPP.
 - b. Withhold an amount of money from the Contractor's Payment Request, equal to the Owner's estimate of the value of the work required to implement and maintain the required BMPs, as well as, provide the required inspection, training, and testing forms.
 - c. Hire a separate QSP to perform the work required to implement the CSMP and deduct the costs thereof from the Contractor's Payment.
- B. Availability and access to the SWPPP
 - 1. The Contractor shall keep a minimum of one copy of the SWPPP and Addenda thereto in the following locations:
 - a. Contractor's Project Site Field Office.
 - b. Contractor's General Business Office.
 - 2. The SWPPP shall be available for public inspection at any time during normal business hours.

3.03 CLEANING AND REMOVAL:

- A. Removal of BMPs
 - 1. Completely remove from the Project Site all materials used to construct and maintain the temporary BMPs upon completion and acceptance of the Project.
 - 2. Remove all accumulated debris and excess material from the BMPs and surrounding locations, and broom clean all adjacent hardscape surfaces to the satisfaction of the Owner.
 - 3. All permanent BMPs shall remain on the Project Site. The Owner will be responsible for ongoing inspection and maintenance after final acceptance.
- B. Under written agreement and with the approval of the Owner, the Contractor may assign maintenance and removal responsibilities of the project BMPs to a subsequent contractor for later work phases at the Project Site.

3.04 RECORD KEEPING:

- A. Paper or electronic records of all CSMP inspections, testing, and training reports, including the Annual Report, shall be retained for a period of at least three years. These records shall be available at the project site until construction is completed.

3.05 PAYMENT:

- A. Full compensation for all costs involved in implementing, and monitoring the implementation of the SWPPP for this project, including inspections, testing, and training, performing corrective measures as required to better implement the SWPPP, providing all labor, materials, and resources to maintain the SWPPP and all required records of the SWPPP, and being full liable for all failures to fulfill the intent and requirements of the CGP set forth by the SWRCB, shall be included in the cost bid for the various items of work and no additional payment will be made therefore.

END OF SECTION

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SECTION 313100 - SOIL STERILIZATION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Furnishing and installing soil sterilant under all new asphaltic-concrete pavement.

1.02 RELATED SECTIONS:

- A. Section 31 20 00 – Earthwork.
- B. Section 32 11 23– Aggregate Base Course.
- C. Section 32 12 16 – Asphalt Concrete Paving.
- D. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specifications sections, apply to the work of this section.

1.03 STANDARDS:

- A. In accordance with the following:
 - CCR-T21 California Code of Regulations, Title 21 Public Works.
 - CBC California Building Code, California Code of Regulations, Title 24, Part 2, CCR-T24.
 - USDA United States Department of Agriculture.
 - EPA Environmental Protection Agency.

All applicable Environmental Regulations and Standards.

1.04 QUALITY ASSURANCE:

- A. Provide licensed operator to apply soil sterilant.
- B. All products shall comply with the current EPA laws at the time of application.

1.05 SUBMITTALS:

- A. Certificates of application.
- B. Certificates of compliance for material use.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Soil Sterilant: Treflan, weed and grass preventer, or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Verify that the site is ready for application.

3.02 PREPARATION:

SOIL STERILIZATION

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- A. Identify installation locations.
- B. Employ equipment and methods appropriate to the work site.

3.03 APPLICATION:

- A. Thoroughly water soak surface to be treated. Avoid excessive water runoff.
- B. Apply sterilant solution over surface to be paved prior to application of asphalt-concrete.
- C. Apply in spray form, at rate as allowable by State of California.

3.04 FIELD QUALITY CONTROL:

- A. Field inspection will be performed per Section 01 40 00 – Quality Requirements.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but is not limited to, the following for termite control:
 - 1. Soil treatment for termite control under all building slabs and footings within exterior walls.
 - 2. At existing building, treat under new slabs and perimeter of remodeled area.

1.3 DEFINITIONS

- A. EPA: Environmental Protection Agency.
- B. PCO: Pest control operator.

1.4 SUBMITTALS

- A. Product Data: Treatments and application instructions, including EPA-Registered Label.
- B. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Soil Treatment Application Report: Within 30 calendar days after application of termiticide is completed, submit report for Owner's record information, including the following as applicable:
 - 1. Date and time of application.
 - 2. Moisture content of soil before application.
 - 3. Brand name and manufacturer of termiticide.
 - 4. Quantity of undiluted termiticide used.
 - 5. Dilutions, methods, volumes, and rates of application used.
 - 6. Areas of application.
 - 7. Water source for application.
- E. Warranties: Special warranties specified in this Section. Provide copy of warranty document in submittal package for review.
- F. Project Closeout Requirements:
 - 1. Warranty.
 - 2. Confirm with Architect if proposal for continuous service will be executed and if so shall be in place prior to Notice of Completion date..

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1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.
- B. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

1.7 COORDINATION

- A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

1.8 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.
- C. Warranty Period: Five years from date of Notice of Completion.

1.9 MAINTENANCE SERVICE

- A. Continuing Service: Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Notice of Completion. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

- A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and

rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

1. Use only products in compliance with TRPA requirements.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. AgrEvo Environmental Health, Inc.; a Company of Hoechst and Schering, Berlin.
 2. American Cyanamid Co.; Agricultural Products Group; Specialty Products Department.
 3. Bayer Corp.; Garden & Professional Care.
 4. DowElanco.
 5. FMC Corp.; Pest Control Specialties.
 6. "Demon MAX" Syngenta Professional Products.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.
- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended by termiticide manufacturer.
- C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

3.3 APPLICATION, GENERAL

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

3.4 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.

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1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
 2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, and piers; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
 3. Crawlspace: Soil under and adjacent to foundations as previously indicated. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
 4. Masonry: Treat voids.
 5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 313116

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SECTION 321123 - AGGREGATE BASE COURSE

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Furnishing, spreading, and compacting aggregate base course.

1.02 RELATED SECTIONS:

- A. Section 31 20 00 – Earthwork: Excavation, Filling, and Grading.
- B. Section 31 31 00 – Soil Sterilization.
- C. Section 32 12 16 – Asphalt Concrete Paving.
- D. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specifications sections, apply to the work of this section.

1.03 REFERENCES:

- A. SSCDOT – Standard Specifications, Department of Transportation, State of California (Caltrans), latest edition, except for references to method of payment, and references to any state furnished materials.

1.04 QUALITY ASSURANCE:

- A. Furnish aggregate materials conforming with SSCDOT.
- B. Perform work in accordance with SSCDOT.

1.05 SUBMITTALS:

- A. Certificates of compliance for materials.
- B. Load tags for delivered material.

1.06 COORDINATION:

- A. Coordinate with other work, including subgrade preparation and soil sterilization.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Aggregate Base: Class 2, ¾ Inch Maximum per SSCDOT.

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PART 3 - EXECUTION

3.01 EXAMINATION OF SUBGRADE:

- A. Verify that subgrade has been compacted to minimum of 95 percent relative compaction and is dry.
- B. Verify elevations of subgrade are correct.

3.02 INSTALLATION OF AGGREGATE BASE COURSE:

- A. Furnish and install in conformance with SSCDOT Section 26, Aggregate Bases.
- B. Thickness – As shown on construction drawings.
- C. Spreading and Compacting – In accordance with SSCDOT. The relative compaction of each layer of compacted base material shall not be less than 95 percent.

3.03 TOLERANCE:

- A. Finished Surface: The surface of the finish aggregate base at any point shall not vary more than 0.03 feet above or below the specified grade at that point. No more than 50% of the finish surface shall be above or below the specific grade for aggregate base.

3.04 FIELD QUALITY CONTROL:

- A. Field inspection and testing will be performed per Section 01 40 00 - Quality Requirements.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but not limited to, the following:
 - 1. Hot-mixed asphalt paving over prepared subbase.
 - 2. Prepared aggregate base.
 - 3. Proof rolling of prepared subbase is included in this Section.
 - 4. Fog seal.
- B. Related Sections include the following:
 - 1. Division 2 Section "Selective Demolitions" for pavement removal and related demolitions.
 - 2. Division 31 Section "Earthwork" for aggregate subbase and base courses and related items.
 - 3. Division 31 Section "Portland Cement Concrete Paving" for concrete pavement and related items.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Material Certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds specified requirements.
- C. Design Data:
 - 1. Submit a job-mix formula, prepared within three years of submittal, for approval by the Architect prior to preparing and placing the bituminous mixture. Design mix using procedures contained in Chapter III, Marshall Method of Mix Design, AI MS-22, January, 1983, ASTM D 1559 and ASTM D 3515. Formulas shall indicate physical properties of the mixes as shown by tests made by a commercial laboratory approved by the Architect, using materials identical to those to be provided on this project. Aggregate gradations will be current within the last six months. Job-mix formula for each mixture shall be in effect until modified in writing by the Contractor and approved by the Architect. Provide a new job-mix formula for each source change.
 - 2. The job-mix formula shall show the following required data:
 - a. Source and proportions, percent by weight, of each ingredient of the mixture.
 - b. Correct gradation, the percentages passing each size sieve listed in the specifications for the mixture to be used, for the aggregate and mineral filler for each separate source and from each different size to be used in the mixture and for the

- composite mixture.
 - c. Amount of material passing the No. 200 sieve determined by dry sieving.
 - d. Number of blows of hammer compaction per side of molded specimen.
 - e. Temperature viscosity relationship of the asphalt cement.
 - f. Stability, flow, percent voids in mineral aggregate, percent air voids, unit weight.
 - g. Asphalt absorption by the aggregate.
 - h. Effective asphalt content as percent by weight of total mix.
 - i. Temperature of the mixture immediately upon completion of mixing.
 - j. Asphalt viscosity grade.
 - k. Plotted curves to show the effect on the test properties of at least four different percentages of asphalt on the items required in "f" above; each point on the curves shall represent the average of at least three specimens.
3. Plot and submit, on Bureau of Public Roads 0.45 power gradation chart paper, the specified aggregate gradation band, the job-mix gradation and the job-mix tolerance band.
4. Selection of optimum asphalt content: Base selection on percent of total mix and the average of values at the following points of the curve for each mix.
- a. Stability: Peak.
 - b. Unit Weight: Peak.
 - c. Percent Air Voids: Median.
5. Test Reports:
- a. Specific gravity test of asphalt.
 - b. Course aggregate tests.
 - c. Weight of slag test.
 - d. Percent of crushed pieces in gravel.
 - e. Fine aggregate tests.
 - f. Specific gravity of mineral filler.
 - g. Bituminous mixture tests.
6. Offsite AC paving shall be per jurisdiction standards for additional requirements.

1.4 SITE CONDITIONS

- A. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 deg F (10 deg C) and when temperature has not been below 35 deg F (1 deg C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- B. Construct hot-mixed asphalt surface course when atmospheric temperature is above 50 deg F (4 deg C) and when base is dry. Base course may be placed when air temperature is above 45 deg F (minus 1 deg C) and rising.
- C. Grade Control: Establish and maintain required lines and elevations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Use locally available materials and gradations that exhibit a satisfactory record of previous installations.

B. Aggregate: Aggregate for asphaltic concrete paving. Grade and proportion aggregates and filler so that combined mineral aggregate conforms to specified grading. Where AC paving is for offsite use, confirm local jurisdiction requirements. More restrictive higher quality requirements will prevail for offsite paving.

1. Coarse Aggregate: ASTM D 692, ASTM C 131, ASTM C 88.
2. Fine Aggregate: ASTM D 1073.
3. Mineral Filler: ASTM D 242.
4. Gradation of Aggregates: ASTM C 136, ASTM D 3515.
Aggregates shall have a gradation within the limits designated in Table 1 or 2, ASTM D 3515 and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve or vice versa, but grade uniformly from coarse to fine.
5. Quantity of Bituminous Material: ASTM D 3515
Mix asphalt cement with aggregates of corresponding mixes as indicated in Table 1 or 2, ASTM D 3515.
6. Composition of Mixture: ASTM D 3515
Gradation of mineral aggregate shall be as specified in Table 1 or 2, ASTM D 3515. The percentage of bituminous material provided in the bituminous mixtures shall be within the limits specified. Mixtures shall have the following physical properties:

Test Property

Values

Stability, ASTM D 1559	Figure 3.19, AI MS-22
Flow (0.01 inch), ASTM D 1559	Figure 3.19, AI MS-22
Percent Air Voids, ASTM D 3203	Figure 3.19, AI MS-22
Percent Voids in Mineral Aggregate	Figure 3.2, AI MS-22

7. Index of Retained Strength: ASTM D 1075.
75 or greater.
8. Variations from Formula:
The job-mix formula tolerances indicated in Table 3, ASTM D 3515, shall be applied to the job-mix formula to establish the job control gradation band. The full tolerances of the gradations still will apply if application of the job-mix tolerances result in a job control grading band outside the master gradation band.
9. Source Quality Control:
Use materials for testing that are identical to materials to be provided in this project. Employ a commercial laboratory approved by the Architect to perform testing.
10. Tests:
Perform testing in accordance with the following.
 - a. Specific gravity test of asphalt: ASTM D 70
 - b. Coarse aggregate tests:
 - 1) Bulk Specific Gravity: ASTM C 127.
 - 2) Abrasion Loss: ASTM C 131.
 - 3) Soundness Loss: ASTM C 88.
 - c. Weight of slag test: ASTM C 29/C 29M.
 - d. Percent of crushed pieces in gravel: Count by observation and weight.
 - e. Fine aggregate tests:
 - 1) Bulk Specific Gravity: ASTM C 128.

- 2) Soundness Loss: ASTM C 88.
- f. Specific gravity of mineral filler: ASTM C 188 or D 854.
- g. Bituminous mixture tests:
 - 1) Bulk Specific Gravity: ASTM D 1188 or D 2726.
 - 2) Theoretical Maximum Specific Gravity: ASTM D 2041.
 - 3) Index of Retained Strength: ASTM D 1075.
- C. Asphalt Cement: Comply with provisions of Asphalt Institute Specifications PMCQS1H - Polymerized Asphalt:
 - 1. Asphalt Cement: Penetration grade 50/60 using AR 8000 oil April to September, and AR 4000 oil, October to March.
- D. Fog Seal:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited, to the following:
 - a. "Topein C"; Paramount Petroleum, 661-978-9357
- E. Herbicide Treatment: Commercial chemical for weed control, registered by Environmental Protection Agency. Provide granular, liquid, or wettable powder form.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
 - a. Ciba-Geigy Corp.
 - b. Dow Chemical U.S.A. "Treflan".
 - c. E.I. Du Pont de Nemours & Co., Inc.
 - d. FMC Corp.
 - e. Thompson-Hayward Chemical Co.
 - f. U.S. Borax and Chemical Corp.
- F. Aggregate Base: Class 2 aggregate base, Cal Trans standards.
 - 1. Aggregate Grading Requirements.

Percentage Passing:

<u>Sieve Sizes</u>	<u>3/4" Maximum Operating Range</u>	<u>Compliance</u>
1"	100	100
3/4"	90-100	87-100
No. 4	35-60	35-65
No. 30	10-30	5-35
No. 200	2-9	0-12

Quality Requirements:

<u>Tests</u>	<u>Operating Range</u>	<u>Compliance</u>
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Resistance (R-value)	---	78 Min.
Sand Equivalent	25 Min.	22 Min.
Durability Index	82	

2. Aggregate for Class 2 aggregate base shall be free from organic matter and other deleterious substances, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base.
 - a. Where existing ac paving is allowed to be grind on site, it shall be mixed with additional materials to meet requirements above.
 - b. Where existing aggregate base is to be recycled, it shall have additional materials to meet requirements above.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

- A. General: Remove loose material from compacted subbase surface immediately before applying herbicide treatment or prime coat.
- B. Proof-roll prepared subbase surface to check for unstable areas and areas requiring additional compaction.
- C. Notify Contractor of unsatisfactory conditions. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.
- D. After preparation of the subgrade and sawcutting/drilling of existing pavement, thoroughly scarify and sprinkle the entire area to be paved and then compact to a smooth, hard, even surface of 90% minimum compaction, unless noted greater, to receive the aggregates.
- E. Subbase (when required):
 1. Spread the specified subbase material to a thickness providing the compacted thickness shown on the Drawings.
 2. Compact to 90% minimum, unless noted greater.
- F. Base:
 1. Spread Class 2 aggregate base (Caltrans Standards), material to a thickness providing the finish grades shown on the Drawings.
 2. Compact to 95% minimum.
- G. Thickness tolerance: Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 0.0" to plus 0.5".
- H. Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 3/8" in 10 feet.
- I. Herbicide Treatment: Apply chemical weed control agent in strict compliance with manufacturer's recommended dosages and application instructions. Apply to compacted, dry subbase prior to application of prime coat.

- J. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.

3.2 PLACING MIX

- A. General: Place hot-mixed asphalt mixture on prepared surface, spread, and strike off. Spread mixture at minimum temperature of 225 deg F (107 deg C). Place areas inaccessible to equipment by hand. Place each course to required grade, cross-section, and compacted thickness.
- B. Paver Placing: Place in strips not less than 10 feet wide, unless otherwise acceptable to Architect. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course.
- C. Immediately correct surface irregularities in finish course behind paver. Remove excess material forming high spots with shovel or lute.
- D. Joints: Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of hot-mixed asphalt course. Clean contact surfaces and apply tack coat.

3.3 ROLLING

- A. General: Begin rolling when mixture will bear roller weight without excessive displacement.
 - 1. Compacting of the asphalt concrete shall be accomplished in three distinct operations. The first operation shall consist of breakdown and initial compaction with an appropriate steel drum roller. The second operation shall consist of compaction with an appropriate pneumatic wheel roller. The final operation shall be finish rolling with a steel drum roller.
 - a. Finish pavements of 2 1/2" unless Contractor has option to use steel drum roller in lieu of rubber tire roller.
- B. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- C. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.
- D. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been evenly compacted.
- E. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained 95 percent laboratory density.
- F. Finish paving smoothness tolerance:
 - 1. Free from birdbaths.
 - 2. No deviations greater than 3/16" in 10 feet.

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- G. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot hot-mixed asphalt. Compact by rolling to specified surface density and smoothness.
- H. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- I. Fog Seal: Apply after paving has been completed and accepted per manufactures written instructions.
- J. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.4 FIELD QUALITY CONTROL

- A. General: Testing in-place hot-mixed asphalt courses for compliance with requirements for thickness and surface smoothness will be done by Owner's testing laboratory. Repair or remove and replace unacceptable paving as directed by the Architect.
- B. Thickness: In-place compacted thickness tested in accordance with ASTM D 3549 will not be acceptable if exceeding following allowable variations:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus or minus 1/4 inch.
- C. Surface Smoothness: Test finished surface of each hot-mixed asphalt course for smoothness, using 10-foot straightedge applied parallel with and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:
 - 1. Base Course Surface: 1/4 inch.
 - 2. Wearing Course Surface: 3/16 inch.
- D. Check surface areas at intervals as directed by the Architect.

3.5 FLOOD TEST

- A. Prior to application of seal coat, perform a flood test in the presence of the Architect.
- B. Method:
 - 1. Flood the entire asphaltic concrete paved area with water by use of a tank truck or hoses.
 - 2. If a depression is found where water ponds to a depth of more than 1/8" in 6 feet, fill or otherwise correct to provide proper drainage.
 - 3. Feather and smooth the edges of fill so that the joint between fill and original surface is invisible.

END OF SECTION 321216

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. This section includes, but not limited to, the following:
 - 1. Extent of Portland cement concrete paving is shown on drawings:
 - a. Broom finish Portland Cement Concrete Paving.
 - b. Light standard base(s) and footing(s).
 - c. Miscellaneous footing(s) for items.
- B. Related sections include the following:
 - 1. Prepared subgrade is specified in "Earthwork" Section, Division 31.
 - 2. Division 33 Sections for locations of yard, valve and utility box and catch basins.
 - 3. Concrete and related materials are specified in Division 3, Section "Cast-in-Place Concrete".
 - 4. Division 31 Section "Earthwork" for requirements for gravel in pull boxes, yard boxes, valve boxes and similar items.
 - 5. Joint fillers and sealers are specified in Division 7, Section "Joint Sealants".

1.3 SUBMITTALS

- A. Provide samples, manufacturer's product data, test reports, and materials' certifications as required in referenced sections for concrete and joint fillers and sealers.
 - 1. Layout of stamped concrete with all terminations, joints, curves and embeds.
- B. Provide field samples of concrete finishes for Architect's review. Coordinate samples with Architect's normally scheduled job visits.
 - 1. Provide 4 foot square sample of each finish type. Allow for multiple variations of each finish - (3) maximum variations.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with local governing regulations if more stringent than herein specified.
- B. All site components i.e. yard boxes, grates, utility boxes and other items shall be ADA compliant and installed within ADA requirements.

1.5 JOB CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
 - 1. Coordinate with requirements for "Temporary Facilities" specified in Division 1.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
 - 1. Use flexible spring steel forms or laminated boards to form radius bends as required.
- B. Coat forms with a nonstaining form release agent that will not discolor or deface surface of concrete.
- C. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60.
- D. Fabricated Bar Mats: Welded or clip-assembled steel bar or rod mats, ASTM A 184. Use ASTM A 615, Grade 60 steel bars, unless otherwise indicated.
- E. Joint Dowel Bars: Plain steel bars, A36. Cut bars true to length with ends square and free of burrs.
- F. Concrete Materials: Comply with requirements of applicable Division 3 sections for concrete materials, admixtures, bonding materials, curing materials, and others as required.
- G. Expansion Joint Materials: Comply with requirements of applicable Division 7 sections for preformed expansion joint fillers and sealers.
- H. Clear Liquid-Membrane Forming and Sealing Curing Compound: Comply with ASTM C 309, Type I, Class B, limited to maximum solvent content 1.6 pound per gallon, unless other type acceptable to Architect. Moisture loss no more than 0.055 gr./sq. cm. when applied at 200 sq. ft. / gal.
 - 1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. "Masterseal"; Master Builders.
 - b. "Aqua Cure"; Euclid Chemical Co.
 - c. "Vocomp 20.25" W.R. Meadows.
 - d. "Kure-N-Seal"; Sonneborn-Contech.
 - e. "Dress and Seal"; L & M Construction Chemicals.
- I. Bonding Compound: Polyvinyl acetate or acrylic base, rewettable type.
 - 1. Available Products: Subject to compliance with requirements, products which may be

incorporated in the work include, but are not limited to, the following:

- a. "J-40 Bonding Agent"; Dayton Superior Corp.
 - b. "Weldcrete"; Larsen Products.
 - c. "Intralok"; W.R. Meadows.
 - d. "Everbond"; L & M Construction Chemicals.
 - e. "EucoWeld"; Euclid Chemical Co.
 - f. "Hornweld"; A. C. Horn.
 - g. "Sonocrete"; Sonneborn-Contech.
 - h. "Acrylic Bondcrete"; The Burke Co.
- J. Epoxy Adhesive: ASTM C 881, 2-component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade", and "Class" to suit project requirements.
1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include but are not limited to the following:
 - a. "Epoxitite"; A. C. Horn.
 - b. "Edoco 2118 Epoxy Adhesive"; Edoco Technical Prod.
 - c. "Sikadur Hi-Mod"; Sika Chemical Corp.
 - d. "Euco Epoxy 463 or 615"; Euclid Chemical Co.
 - e. "Patch and Bond Epoxy"; The Burke Co.
 - f. "Sure-Poxy"; Kaufman Products Inc.
 - g. "Rezi-Weld 1000 - Gel Paste"; W. R. Meadows
- K. Yard Boxes / Catch Basins / Utility Boxes: Shall be concrete precast per ASTM C 478 or ASTM 858 min. 12" deep with added sections as required to get to depth of pipe, valve, etc. High density reinforced concrete, all boxes and covers/grates shall be heavy vehicular traffic rating.
1. Utility Boxes: Refer to mechanical, plumbing, and/or electrical drawings for size of utility box. Cast iron lid unless noted otherwise. Heavy vehicular traffic rating.
 - a. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - (1) Christy Concrete Products.
 2. Valve Boxes: Refer to mechanical, plumbing, and/or electrical drawings for size of valve box. Cast iron lid. Heavy vehicular traffic rating.
 - a. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - (1) Christy Concrete Products, "G8 Curb Valve Box".
- L. Preformed Expansion Filler: Composed of cellular fibers securely bonded together and uniformly saturated with asphalt. It is non-extruding, resilient and when compressed to half its thickness, with a minimum recovery of 70%, will not deform, twist or break with ordinary handling.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 - a. "Sealtight Fibre Expansion Joint Filler," W. R. Meadows.

2.2 CONCRETE MIX, DESIGN, AND TESTING

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- A. Comply with requirements of applicable Division 3 sections for concrete mix design, sampling and testing, and quality control and as herein specified.
- B. Design mix to produce normal-weight concrete consisting of Portland cement, aggregate, water-reducing or high-range water-reducing admixture (superplasticizer), air-entraining admixture, and water to produce the following properties:
 - 1. Compressive Strength: 3500 psi, minimum at 28 days, unless otherwise indicated.
 - 2. Slump Limits: 3 inches for other concrete.
 - 3. Air Content: 5 to 8 percent based on size of aggregate.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

- A. Remove loose material from compacted subgrade surface immediately before placing concrete.

3.2 FORM CONSTRUCTION

- A. Set forms to required grades and lines, braced and secured. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork for grade and alignment to following tolerances:
 - 1. Top of forms to create a concrete grade tolerance of not more than 1/8 inch in 10 feet.
 - 2. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.
- C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.
- D. Slope step treads at 1/8 inch per foot to drain. Provide metal nosing at all steps with more than 1 riser, where indicated.

3.3 REINFORCEMENT

- A. Locate, place and support reinforcement as specified in Division 3 sections, unless otherwise indicated.

3.4 CONCRETE PLACEMENT

- A. General: Comply with requirements of Division 3 sections for mixing and placing concrete, and as herein specified.
- B. Do not place concrete until subgrade and forms have been checked for line and grade. Moisten subgrade if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

- C. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
- D. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- E. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place a construction joint.
- F. When adjacent pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained sufficient strength to carry loads without injury.

3.5 JOINTS (SEE DRAWINGS FOR MORE RESTRICTIVE SPACING)

- G. General: Construct expansion, weakened-plane (contraction), and construction joints true to line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
- H. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.
- I. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints, sectioning concrete into areas as shown on drawings. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:
 - 1. Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.
- J. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for more than 1/2 hour, except where such placements terminate at expansion joints.
 - 1. Construct joints as shown.
 - 2. Provide load transfer-slip dowel devices--#4 min. size @ 18" o.c. min., install so that one end of each dowel bar is free to move. Provide at all construction joints.
- K. Expansion Joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.
 - 1. Locate expansion joints as indicated on drawings or 20' maximum, whichever is less.
 - 2. Start/finish of all radius and direction changes.
 - 3. Locate expansion joints as indicated on drawings for concrete paving or 20' maximum any direction--whichever is less.
- L. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
- M. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.

- N. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
- O. Fillers and Sealants: Comply with requirements of applicable Division 7 sections for preparation of joints, materials, installation, and performance.

3.6 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical screeding and floating is not possible. Adjust floating to compact surface and produce uniform texture.
 - 1. Where medium or heavy broom finishes are required or indicated, concrete must be tamped to avoid brooming operations from exposing large aggregate.
- B. After floating, test surface for trueness with a 10-ft. straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish. No level deviation between pours will be accepted unless details on Plans specifically require.
 - 1. If non-slip aggregate is required or indicated, dust surface with 7.5 lbs of aggregate chips per 100 sq.ft. evenly. Do not wet non-slip aggregate prior to installation. (See also below for second application).
 - 2. Re-float concrete to imbed aggregate chips.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2-inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling and finish surface as follows:
 - 1. Where non-slip aggregate is required or indicated, (in addition to above during floating) dust surface with 7.5 lbs of aggregate chips per 100 sq.ft. evenly. Do not wet non-slip aggregate prior to installation.
 - 2. Hard trowel aggregate chips to imbed into concrete surface.
 - 3. Complete hard trowel finishing of surface, edges and joints. Eliminate all tool marks.
 - 4. Broom finish as indicated; otherwise finish concrete smooth, free of tool marks and voids in surface.
 - a. Broom finish- use fine, medium or heavy bristled broom specifically designed for type of concrete finish indicated.
 - 1) Medium broom finish on all surfaces less than 6% slopes.
 - 2) Heavy broom finish on all surfaces 6% and greater slopes.
 - b. Broom from one direction only. Broom a complete section at one time. Do not broom previously broomed section at a later time. This will produce a color and texture variation that may be cause for rejection.
 - c. Provide a uniform finish through out entire concrete operations of type of finish indicated. Provide line texture acceptable to the Architect.
 - d. Medium broom finish on all surfaces less than 6% slope.
 - e. Heavy broom finish on all surfaces greater than 6% slope.
 - 5. Broom finish:

- a. For fine broom finish, wet broom, broom in one direction only. Wash broom after each stroke, shake off excess water.
 - b. Medium or heavy broom finish, start with damp broom, broom in one direction only. Shake off concrete laitance after each stroke. It is common to see concrete laitance ball up and fall off trailing edge of broom. Do not remove these laitance until such time as removal/clean up will not damage concrete surface or broom markings.
- 6. All concrete brooming whether fine, medium or heavy will take place at the same set point of concrete cure as for fine broom finish.
- 7. Tolerances:
 - a. Concrete Flatness Ft = 20.
 - b. Concrete Levelness FI = 25.
- E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by the Architect.

3.7 CURING

- A. Protect and cure finished concrete paving in compliance with applicable requirements of Division 3 sections. Use membrane-forming curing and sealing compound or approved moist-curing methods.

3.8 REPAIRS AND PROTECTIONS

- A. Repair or replace broken or defective concrete, as directed by the Architect.
 - 1. Concrete damaged by construction or non-conforming work shall be removed/replaced to nearest full panel to control joint. Architect shall review aesthetic appearance of repair and work shall be approved by the Architect prior to being accepted.
- B. Drill test cores where directed by Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

END OF SECTION 321313

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes, but not limited to, the following:
 - 1. Galvanized steel chain link fence and gates.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 3 Section "Cast-in-Place Concrete" for concrete for post footings.
 - 2. Division 5 Section "Metal Fabrications" for fencing metal gates built from tube steel and related materials.
 - 3. Division 5 Section "Metal Fabrications" for metal fabrication for chain link fencing to receive hardware and related items.
 - 4. Division 8 Section "Door Hardware" for panic devices, lever hardware, and related items.
 - 5. Division 31 Section "Earthwork" for filling and grading work.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
 - 1. Product data in the form of manufacturer's technical data, specifications, and installation instructions for fence and gate posts, fabric, gates, and accessories.
 - 2. Shop drawings showing location of fence, gates, each post, and details of post installation, extension arms, gate swing, hardware, and accessories.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain chain link fences and gates as complete units, including necessary erection accessories, fittings, and fastenings from a single source or manufacturer.

PART 2 - PRODUCT

2.1 MANUFACTURERS

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- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Galvanized Steel Fencing and Fabric:
 - a. Allied Tube and Conduit Corp.
 - b. American Chain Link Fence Company
 - c. American Tube Company
 - d. Anchor Fence, Inc.
 - e. Capitol Wire and Fence Co., Inc.
 - f. Century Tube Corp.
 - g. Cyclone Fence Div./USX Corp.

2.2 FABRIC

- A. Steel Fabric: Comply with Chain Link Fence Manufacturers Institute (CLFMI) Product Manual. Furnish one-piece fabric widths for fencing up to 12 feet high. Wire size includes zinc coating.

1. Size: 2-inch mesh, 9-gage (0.148-inch diameter) wire.
2. Galvanized Steel Finish: ASTM A 392, Class 2, with not less than 2.0 oz. zinc per sq. ft. of uncoated wire surface on wire coated before weaving or not less than 2.0 oz. zinc per sq. ft. of uncoated wire surface on wire of fabric coated after weaving as determined from the average of two or more samples and not less than 1.8 oz. zinc per sq. ft. of uncoated wire surface for any individual sample.

2.3 FRAMING

- A. Strength requirements for posts and rails conforming to ASTM F 669.
- B. Pipe shall be straight, true to section, material, and sizes specified, and shall conform to the following weights per foot:

<u>NPS in inches</u>	<u>Outside Diameter (OD) in inches</u>	<u>Type I Steel</u>
1	1.315	1.68
1-1/4	1.660	2.27
1-1/2	1.900	2.72
2	2.375	3.65
2-1/2	2.875	5.79
3	3.500	7.58
3-1/2	4.000	9.11
4	4.500	10.79
6	6.625	18.97
8	8.625	28.55

- C. Steel Framework, General: Posts, rails, braces, and gate frames.
1. Type I Pipe: Hot-dipped galvanized steel pipe conforming to ASTM F 1043, plain ends, standard weight (schedule 40) with not less than 1.8 oz. zinc per sq. ft. of surface area coated, (Type A)

- D. End, corner, and pull posts for following fabric heights:
 - 1. Up to 6 feet: 2.375-inch OD Type I.
 - 2. Over 6 feet: 2.875-inch OD Type I.
- E. Line or intermediate posts for following fabric heights:
 - 1. Up to 6 feet: 1.90-inch OD Type I.
 - 2. Over 6 feet: 2.375-inch OD Type I.
- F. Gate Posts: Furnish posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:
 - 1. Up to 6 feet: 2.875-inch OD Type I.
 - 2. Over 6 feet to 13 feet: 4.00-inch OD Type I.
 - 3. Over 13 feet to 18 feet: 6.625-inch OD Type I steel pipe.
- G. Top Rail: Manufacturer's longest lengths, with expansion-type couplings, approximately 6 inches long, for each joint. Provide means for attaching top rail securely to each gate corner, pull, and end post.

2.4 FITTINGS AND ACCESSORIES

- A. Material: Comply with ASTM F 626. Mill-finished aluminum or galvanized iron or steel, to suit manufacturer's standards.
 - 1. Zinc Coating: Unless specified otherwise, galvanize steel fence fittings and accessories in accordance with ASTM A 153, with zinc weights per Table I.
- B. Tension Wire: 0.177-inch-diameter metallic-coated steel marcelled tension wire conforming to ASTM A 824 with finish to match fabric.
 - 1. Type II Zinc Coated in following class:
 - a. Class 2, with a minimum coating weight of 1.20 oz. per sq. ft. of uncoated wire surface.
- C. Post and Line Caps: Provide weathertight closure cap for each post.
- D. Tension or Stretcher Bars: Hot-dip galvanized steel with minimum length 2 inches less than full height of fabric, minimum cross-section of 3/16 inch by 3/4 inch and minimum 1.2 oz. zinc coating per sq. ft. of surface area. Provide one bar for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into post.
- E. Tension and Brace Bands: Minimum 3/4-inch-wide hot-dip galvanized steel with minimum 1.2 oz. zinc coating per sq. ft. of surface area.
 - 1. Tension Bands: Minimum 14 gage (0.074 inch) thick.
 - 2. Tension and Brace Bands: Minimum 12 gage (0.105 inch) thick.

2.5 GATES

- A. Poly Slats: Polyethylene slats, .020 thickness - 80% privacy factor. Color as selected from standard colors.

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1. Patrician Products, Inc., or approved equal, 468 Union Avenue, Westbury, NY 11590 "Polyslates".
2. Kuflinks, Kuflo

B. Horizontal-Slide Gates

1. General: Comply with ASTM F 1184 for gate posts and single sliding gate types.
 - a. Classification: Type II Cantilever Slide, Class 1 with external.
 - 1) Gate Frame Width and Height: As indicated.
2. Pipe and Tubing:
 - a. Zinc-Coated Steel: Protective coating and finish to match fence framing.
 - b. Gate Posts: Comply with ASTM F 1184. Provide round tubular steel posts.
 - c. Gate Frames and Bracing: Round tubular steel.
3. Frame Corner Construction: Welded
4. Extended Gate Posts and Frame Members: Extend gate posts and frame end members above top of chain-link fabric at both ends of gate frame 12 inches (300 mm) as required to attach barbed assemblies.
5. Hardware:
 - a. Latches permitting operation from both sides of gate[with provision for padlocking accessible from both sides of gate].
 - b. Hangers, roller assemblies, and stops fabricated from galvanized steel.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install fence in compliance with ASTM F 567. Do not begin installation and erection before final grading is completed, unless otherwise permitted.
 1. Apply fabric to outside of framework. Install fencing on boundary lines inside of property line established by survey as required by Division 1.
- B. Excavation: Drill or hand-excavate (using post-hole digger) holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
 1. If not indicated on drawings, excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than 4 times largest cross-section of post.
 2. Unless otherwise indicated, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.
- C. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Space maximum 10 feet o.c., unless otherwise indicated.

1. Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.
 - a. Unless otherwise indicated, extend concrete footings 2 inches above grade and trowel to a crown to shed water.
- D. Top Rails: Run rail continuously through line post caps, bending to radius for curved runs and at other posts terminating into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.
- E. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.
- F. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric before stretching fabric and tie to each post with not less than same gage and type of wire. Pull wire taut, without sags. Fasten fabric to tension wire with 11-gage hog rings of same material and finish as fabric wire, spaced maximum 24 inches o.c.
- G. Fabric: Leave approximately 2 inches between finish grade and bottom salvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, and anchor to framework so that fabric remains in tension after pulling force is released.
- H. Tension or Stretcher Bars: Thread through or clamp to fabric 4 inches o.c., and secure to end, corner, pull, and gate posts with tension bands spaced not over 15 inches o.c.
- I. Tie Wires: Use U-shaped wire of proper length to secure fabric firmly to posts and rails with ends twisted at least 2 full turns. Bend ends of wire to minimize hazard to persons or clothing.
 1. Maximum Spacing: Tie fabric to line posts 12 inches o.c. and to rails and braces 24 inches o.c.
- J. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

END OF SECTION 323113

SECTION 331000 - SITE WATER SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Furnish and Install pipe and fittings for water piping.
- B. Valves and valve boxes, water meter and box.
- C. Backflow preventer, detector check valve, post indicator valve, fire department connection.
- D. Accessories.

1.02 RELATED SECTIONS:

- A. Section 31 14 00- Soil Materials
- B. Section 31 23 00-Trench Excavation and Backfilling

1.03 REFERENCES:

- A. ANSI/ASTM D1557 – Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
- B. ANSI/ASTM D2466 – Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
- C. ANSI/AWWA C110 – Ductile Iron and Grey-Iron Fittings, 3 inch through 48 inch, for Water and Other liquids.
- D. ANSI/AWWA C151 – Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
- E. ANSI/AWWA C500 – Gate Valves, 3 through 48 in NPS for Water and Sewage Systems.
- F. ANSI/AWWA C900-Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch for Water.
- G. ASTM D1785-Poly (Vinyl Chloride) PVC Plastic Pipe, Schedules 40, 80 and Class 200.
- H. ASTM D2855-Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.
- I. ASTM D3139 – Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.

1.04 SUBMITTALS:

- A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 COORDINATION:

- A. Coordinate work with Owner personnel.
- B. Verify that the location of existing utilities have been indicated at work site by utility authorities and Owner personnel.

1.06 EXISTING UTILITIES:

- A. The Engineer has indicated on the plans the location of all known existing utility facilities within the work area. The location of said facilities shall be considered approximate only, until exposed by the Contractor.
- B. Service laterals have been shown where information was available. The location of said facilities shall be considered approximate only, until exposed by the Contractor.
- C. Contractor shall verify all utilities within the work area, including using hand method. Contractor shall protect all existing utilities not designated to be removed.
- D. Maintain all existing utility mains and service lines in constant service during construction of the work.

1.07 PROJECT RECORD DOCUMENTS:

- A. Submit under provisions of Section 01 78 39 – Project Record Documents.
- B. Accurately record actual locations of utilities encountered.

PART 2 - PRODUCTS

2.01 WATER PIPE:

- A. For Above Ground Pipe:
 - 1. Ductile Iron Pipe (ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51) Class 50 with cement – mortar lining and seal coating (ANSI/AWWA C104/A21.4) with Ductile Iron Fittings (ANSI/AWWA C110/A21.10) and flanged joints.
- B. For Underground Pipe:
 - 1. With Schedule 80 PVC Fittings and Solvent Welded joints (ASTM D2855)(ANSI/ASTM D2464) (for pipe 3" and smaller) PVC Pipe (ASTM D1785) Schedule 40; 1120 high impact.
 - 2. (for pipe 4" and larger): PVC Pipe C900 Class 200(ANSI/AWWA). 1120 high impact. With Cast Iron Fittings(ANSI/AWWA C111) and compression gasket ring Joints: (ASTM D3139)

2.02 GATE VALVES:

- A. 1/2" and smaller: Nibco T-580 -66 bronze ball valve or an approved equal.
- B. Between 2" and 3" gate valves-Brass disc or Bronze body, non-rising stem, inside screw, single wedge or disc, IPS ends.

C. 3 inches and Over:

1. C500 (ANSI/AWWA) Iron body, bronze trim, non-rising stem with square nut or Control handle wheel, single wedge, threaded or flanged.

2.03 VALVE BOXES AND COVERS, WATER METERS AND BOXES:

- A. Precast Reinforced Concrete. Cast Iron lid marked for water service. Christy G5 traffic box or approved equal. One piece of PVC riser extension shall be provided.

2.04 BACKFLOW PREVENTOR, DETECTOR CHECK VALVE, VAULT, POST INDICATOR VALVE AND FIRE DEPARTMENT CONNECTION:

- A. Backflow preventor, detector check valve, vault, post indicator valve and fire department connection shall be as per detail drawing and meet the local governing agency.

2.05 ACCESSORIES:

- A. Concrete for Thrust Blocks and Valve Box Surface Collars: Class 3, 5 ½ sack Concrete.
- B. Solvent Cement and Primer for PVC Pipe and Fittings: Per ASTM F656 and ASTM D2564.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Verify site conditions. Locate, identify, and protect existing above and below grade utilities from damage.
- B. Due to the scale of the drawings, it is not possible to indicate all offsets, fittings, etc., which may be required. The Contractor should furnish such fittings, as may be required to meet existing conditions. Drawings are generally diagrammatic and indicative of the work to be installed in the most direct and workmanlike manner.

3.02 PREPARATION:

- A. Protect all improvement not authorized for removal.
- B. Employ equipment and methods appropriate to the work site.
- C. Identify location of proposed water facilities to be constructed. Expose connection points to existing system.
- D. Protect excavated areas from drainage inflow, and provide drainage to all excavated areas. Dewater as necessary.
- E. Comply with safety requirements as they pertain to excavations, per Section 31 23 00/3.01C.

3.03 EXCAVATION:

- A. Excavate soil required to locate existing utilities and install the work, use hand method as necessary in congested area.

- B. Employ equipment and methods appropriate to the work site.
- C. Cut trenches just wide enough to enable installation and proper backfill and do not interfere with 45 degree bearing splay of foundations. When excavating through tree roots, cut roots by hand.
- D. Excavate trenches to provide the minimum cover required.
- E. Excavate trenches, pits, or holes bottoming in hardpan to a minimum of 6 inches below the grade for the bottom of the pipe and any couplings.
- F. In all trenches or excavation sites where a firm foundation is not encountered, such as soft, spongy, or otherwise unsuitable material, remove the material to a minimum of 12 inches, or to a depth determined by the Engineer, below the bottom of the proposed pipe or structure.
- G. Stockpile excavated material to be returned to trench adjacent thereto in location, which will not be detrimental to existing improvements, or pedestrian or vehicular traffic. Remove unsuitable or excess materials not being used, from site.

3.04 INSTALLATION AND BEDDING OF WATER PIPELINE:

- A. Where trench has been overexcavated, place bedding material at the bottom of excavations, level soil materials in continuous layers not exceeding 6 inches uncompacted depth.
- B. Backfill around sides and to a level one foot above the top of pipe with bedding soil.
- C. Install pipe at locations and depths indicated on plans. All of the water pipeline will have a minimum of 36" of cover.
- D. Install Pipe, fittings and associated materials in accordance with manufacturers recommendations.
- E. Route Pipe in straight line, whenever possible. All changes in direction of pipes shall be made with fittings not by bedding. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- F. Form and place concrete for thrust blocks at each elbow, tee, angle or other significant change of direction in loose-joint pipe, per detail on plans.
- G. Backfill trench or other excavation in accordance with Section 31 23 00 – Trench Excavation Backfill.

3.05 INSTALLATION-VALVES:

- A. Set valves on solid bearing, center and plumb valve box and any necessary extensions over valve. Set box cover flush with finished grade.
- B. Form and place concrete for thrust block.
- C. Pour concrete collar around top of valve box per detail on plans.

3.06 INSTALLATION – THREADED CONNECTIONS:

- A. Assemble all plastic and galvanized steel threaded pipe and fittings using an approved Teflon tape applied to the male threads only. A minimum of (2) wraps and a maximum of three (3) wraps of an approved Teflon tape will be required.
- B. At all plastic (PVC) pipe connections, work the ductile iron connections first. Connections shall always be plastic into steel, never steel into plastic.
- C. A non-hardening sealant and lubricant similar to Permatex #51 or LASCO blue pipe, sealant may be used in lieu of Teflon tape. Apply sealant to clean male threads brushing into grooves and to the first three threads of the female threads.

3.07 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM:

- A. Disinfect all domestic water piping systems in accordance with AWWA Standard C601, "AWWA Standard for Disinfecting Water Mains". Disinfection process shall be performed in cooperation with health department having jurisdiction. During procedure, signs shall be posted at each water outlet stating, "Chlorination – Do Not Drink". After disinfection, water samples shall be collected for bacteriological analysis. Certificate of Bacteriological Purity shall be obtained and delivered to the engineer.

3.08 FIELD QUALITY CONTROL:

- A. Field inspection and testing will be performed as per Section 01 40 00 – Quality Requirements.
- B. Pressure-test all water pipelines.
- C. Compaction testing will be performed in accordance with ANSI/ASTM D1557.

END OF SECTION

SECTION 331300 - DISINFECTION OF WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

3.01 SUMMARY:

A. Work Included

1. Disinfection of potable water distribution system.
2. Pressure testing of water system.
3. Testing and reporting results.

3.02 RELATED DOCUMENTS:

A. In addition to the Drawings, the general provisions of the Contract, including General and Special Conditions, and the Division 01 specification Section, the following Documents are related to and assist in the definition of the requirements of this Section:

1. Section 33 10 00 – Site Water Systems

3.03 QUALITY ASSURANCE:

A. Perform Work in accordance with ANSI/AWWA C651.

B. Applicator Qualifications:

1. Water Treatment Firm: Company experienced in disinfecting potable water systems specified in this Section with minimum three years of experience.

C. Testing Laboratory Qualifications:

1. Testing laboratory qualified in testing potable water, certified by the State of California.

D. Regulatory Requirements

1. Work under this Section shall be done in accordance with the County of Fresno, Environmental Health.

E. References

1. In accordance with Specifications Section 01 40 00 - Quality Requirements and the following.
 - a. AWWA C652 - Standard for Disinfection of Water Storage Facilities.
 - b. ANSI/AWWA B300 - Standard for Hypochlorites.
 - c. ANSI/AWWA B301 - Standard for Liquid Chlorine.
 - d. ANSI/AWWA B303 - Standard for Sodium Chlorite.
 - e. ANSI/AWWA C601 and C651 - Standards for Disinfecting Water Mains.

3.04 SUBMITTALS:

A. Submit in accordance with Specification Section 01 33 00, Submittal Procedures.

1. Indicate results comparative to specified requirements.
2. Certificate
 - a. Certify that cleanliness of water distribution system meets or exceeds the following requirement:
 - 1) Coliform M.P.N./100 ML water is 1.1 or less.

3.05 PROJECT RECORD DOCUMENTS:

- A. In Accordance with Section 01 77 00 – Closeout Procedures.
 1. Disinfection report; record:
 - a. Type and form of disinfectant used.
 - b. Date and time of disinfectant injection start and time of completion.
 - c. Test locations.
 - d. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
 - e. Date and time of flushing start and completion.
 - f. Disinfectant residual after flushing in ppm for each outlet tested.
 2. Bacteriological report; record:
 - a. Date issued, project name, and testing laboratory name, address, and telephone number.
 - b. Time and date of water sample collection.
 - c. Name of person collecting samples.
 - d. Test locations.
 - e. Coliform bacteria test results for each outlet tested.
 - f. Certification that water conforms, or fails to conform, to bacterial standards of Section 33 13 00/3.03.
 - g. Bacteriologist's signature and authority.

PART 2 - PRODUCTS

2.01 DISINFECTION CHEMICALS:

- A. Chemicals:
 1. Hypochlorite, in accordance with ANSI/AWWA B300.
 2. Liquid Chlorine, in accordance with ANSI/AWWA B301.
 3. Sodium Chlorite, in accordance with ANSI/AWWA B303.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Verify that piping system and appurtenances has been cleaned and inspected.

- B. Schedule disinfection activity to occur prior to pressure testing and pressurizing of installed system.

3.02 PREPARATION:

- A. Limit contaminated materials from entering water piping and appurtenances during construction.
 - 1. Remove, by initial flushing with potable water, contaminated materials which may have entered the system during construction.
- B. Provide required equipment and facilities to perform the work of disinfection.
 - 1. Provide sufficient number of suitable outlets to permit flushing of facilities at a velocity of at least 5.5 feet per second, to permit the obtaining of bacteriologic test samples, and to permit pressure testing.
 - 2. Outlets provided shall be in addition to those which may be shown on the plans, and shall conform to Section 33 10 00: Site Water Systems.
- C. Provide sufficient number of valves (complete with valve boxes), as necessary, to isolate system for flushing, pressure testing and disinfection purposes.
 - 1. Valves and valve boxes shall be in addition to those shown on the plans, and shall conform to Section 33 10 00 - Site Water Systems.
- D. Provide drainage so that water facilities cannot be contaminated by flushing outlets.

3.03 EXECUTION:

- A. General:
 - 1. Perform work in accordance with ANSI/AWWA C651.
- B. Water System, Pipelines, Pumps, Valves and Fittings.
 - 1. Disinfection Process:
 - a. Disinfect at each water system improvement location where connection and/or alteration is made to the existing potable water system located downstream.
 - b. Disinfect after initial flushing and prior to allowing the system at such location to be pressurized.
 - c. Introduce chlorine gas or chlorine compound solution made with liquid chlorine, calcium hypochlorite in solution or sodium hypochlorite solution mixed with water into the water piping and appurtenances to form a chlorine concentration of approximately 100 parts per million (ppm), or that which will provide a minimum residual of 50 ppm in all parts of the water piping and appurtenances after 24 hours have elapsed.
 - d. The placing of HTH capsules or tablets in pipe sections during the laying process will be considered an acceptable method of introducing chlorine for the test.
 - 2. Sterilization Period

- a. During the sterilization period, all valves (except those isolating the system being disinfected) and other accessories shall be operated.
- b. After a minimum of 24 hours have elapsed since introduction of the chlorine, flush treated water from the water piping and appurtenances using potable water.
 - 1) After a minimum of 48 hours after flushing per Section 33 13 00/3.02A, have bacteriologic samples of water from the piping and appurtenances to be tested extracted from the system by testing laboratory.

3. Bacteriological Tests:

- a. Have bacteriologic tests performed by testing laboratory per Section 033 13 00/1.03.
- b. If the bacteriologic tests show a coliform M.P.N./100 ML water of 1.1 or less on all samples at a particular installation site, the water facilities tested will be considered clear.
- c. In the event the coliform number is above 1.1, the sterilization and testing procedure shall be repeated until the required standard is reached.

4. Pressure Test

- a. Pressure test system to a hydrostatic pressure of 100 pounds per square inch gauge, only after bacteriologic tests have passed, for each construction location.
- b. Maintain pressure test for 90 minutes.
- c. Pressure tests shall be performed in the presence of the Agency's representative.
- d. Repair any leaks detected by hydrostatic pressure test and repeat disinfection and testing process.

5. All costs of disinfection, bacteriologic testing and reporting, and pressure testing shall be borne by the Contractor, and including all additional outlets, valves and valve boxes necessary to accomplish the work.

C. Water Tanks

1. Preparation

- a. Upon completion of tank painting, the tanks shall be cleaned and filled with water.

2. Disinfection

- a. The tanks shall be disinfected in accordance with AWWA C652.
- b. Disinfection shall be by application of chlorine in a chlorine bearing compound form.

3. Sterilization Period

- a. The chlorinated water shall remain in the tank for at least 24 hours.
- b. The tank shall then be drained and filled to capacity with potable water.

4. Bacteriological Tests:

- a. Water samples shall be taken by the Engineer and delivered to a certified water laboratory for bacteriological and volatile organics testing.
- b. Should the test indicate the presence of coliform organisms or volatile organics, the entire disinfection procedure shall be repeated.

3.04 QUALITY CONTROL:

- A. Provide copies of testing and reports.

END OF SECTION

RSUSD - NEW KINDERGARTEN PROJECT

SECTION 333000 - SITE SEWER SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Furnish and Install site sanitary sewer collection systems including pipe and fitting.
- B. Sewer manhole, cover and frame.
- C. Cleanout.
- D. Sewer lift station.

1.02 RELATED SECTIONS:

- A. Section 31 14 00- Soil Materials
- B. Section 31 23 00-Trench Excavation and Backfilling

1.03 REFERENCES:

- A. American Water Works Association(AWWA)
- B. American Society for Testing and Materials(ASTM)
- C. Designation D3034 – Polyvinyl Chloride(PVC) pipe.

1.04 SUBMITTALS:

- A. Submit under provisions of Division 0 – Contract General Conditions.
- B. Certificates of compliance for material.
- C. Product Data: Provide data indicating pipe, accessories, and associated equipment to be furnished.
- D. Manufacturer's Installation Instructions: Indicate special procedures required to install products supplied.

1.05 COORDINATION:

- A. Coordinate work with Owner personnel.
- B. Verify that the location of existing utilities have been indicated at work site by utility authorities and Owner personnel.

1.06 EXISTING UTILITIES:

- A. The Engineer has indicated on the plans the location of all known existing utility facilities within the work area. The location of said facilities shall be considered approximate only, until exposed by the Contractor.
- B. Service laterals have been shown where information was available. The location of said facilities shall be considered approximate only, until exposed by the Contractor.

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- C. Contractor shall verify all utilities within the work area, including using hand method. Contractor shall protect all existing utilities not designated to be removed.
- D. Maintain all existing utility mains and service lines in constant service during construction of the work.

1.07 PROJECT RECORD DOCUMENTS:

- A. Submit under provisions of Section 01 78 39 – Project Record Documents
- B. Accurately record actual locations of utilities encountered.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Sanitary sewer pipelines shall be Polyvinyl Chloride(PVC) pipe for sanitary sewers conforming to ASTM Designation: 3034, SDR-35.
- B. Cleanout Boxes shall be precast reinforced concrete and cast iron lid marked for sewer service. Christy F8 or approved equal.
- C. Sewer manhole, cover, frame, cleanout and box shall be as per detail drawing.
- D. Concrete for structures shall conform to Section 03 30 00 "Cast-in-Place Concrete" and be constructed per detailed drawing.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Verify site conditions. Locate, identify, and protect existing above and below grade utilities from damage.

3.02 PREPARATION:

- A. Protect all improvement not authorized for removal.
- B. Employ equipment and methods appropriate to the work site.
- C. Identify location of proposed sewer facilities to be constructed. Expose connection points to existing system.
- D. Protect excavated areas from storm drainage inflow, and provide drainage to all excavated areas. Dewater as necessary.
- E. Comply with safety requirements as they pertain to excavations, per Section 31 23 00/3.01C.

3.03 EXCAVATION:

- A. Excavate soil required to locate existing utilities and install the work, use hand method as necessary in congested area.

- B. Employ equipment and methods appropriate to the work site.
- C. Cut trenches just wide enough to enable installation and proper backfill and do not interfere with 45 degree bearing splay of foundations. When excavating through tree roots, cut roots by hand.
- D. Excavate trenches to provide the minimum cover required.
- E. Excavate trenches, pits, or holes bottoming in hardpan to a minimum of 6 inches below the grade for the bottom of the pipe and any couplings.
- F. In all trenches or excavation sites where a firm foundation is not encountered, such as soft, spongy, or otherwise unsuitable material, remove the material to a minimum of 12 inches, or to a depth determined by the Engineer, below the bottom of the proposed pipe or structure.
- G. Stockpile excavated material to be returned to trench adjacent thereto in location, which will not be detrimental to existing improvements, or pedestrian or vehicular traffic. Remove unsuitable or excess materials not being used, from site.

3.04 PIPE INSTALLATION:

- A. Pipe Laying: Sewer pipe shall be laid in strict conformity to the prescribed line and grade. The elevation of the pipe invert shall not deviate from the design elevation by more than +2 percent to the pipe size concerned, or 1 inch, whichever is greater. The rate of deviation from grade or returning to grade shall be limited to 1/16 inch per foot of pipe. Pipe laying shall proceed upgrade with the bell ends of bell and spigot pipe placed upstream. Each section of pipe shall be laid to line and grade as herein specified and in such a manner as to form a watertight, concentric joint with the adjoining pipe. The interior of the pipe shall be cleared of all dirt and debris and excess joint sealing material as the work progresses. Pipe shall not be laid when the condition of the trench or weather is unsuitable. All open ends of pipe and fittings shall be adequately and securely closed whenever the work is discontinued.
- B. Sewer Systems Plugs: Temporary plugs of brick or mortar shall be installed on all sewer projects at points of connection to existing facilities. These plugs shall remain in place until completion of the balling and flushing operation., drainage, or any other condition from entering the existing system, shall be installed or removed in the presence of and under the direct supervision of the Engineer. Until the system has been pumped clear of accumulated water, the plugs shall not be removed. This water must not be allowed to enter adjacent sewer or drainage systems.

3.05 INSTALLATION OF CLEANOUTS:

- A. Install cleanouts at end of lines, at changes of direction greater than 45 degrees, and at spacing not greater than of 100-foot intervals. Locate cleanouts in accessible locations and bring flush to finished surface.

3.06 INSTALLATION OF SEWER MANHOLE:

- A. Install sewer manhole as indicated on the construction plans, in accordance with the manufacturer's recommendations and as specified herein.

3.07 BACKFILLING TO FINISH GRADE AND FINISH GRADING:

- A. Backfill from bottom of the trench to pipe grade with type B and C soil.
- B. After installation of pipes and appurtenances and backfill of pipe bedding material.
- C. Backfill trenches above pipe bedding material and to within 6 inches of finish subgrade with type A, B, & C soils. Compact all soil backfill not exceeding 8 inches in uncompacted thickness. Maintain optimum moisture content of fill materials.
- D. Backfill final 6 inch thickness to finish subgrade in areas to receive concrete, asphalt-concrete, aggregate base, or other non-vegetative surface improvement, with type B or C soils.
- E. Backfill final 6 inch thickness to finish subgrade in areas to receive sod, other vegetation, or bare soil with type A soil.
- F. Obtain 85 percent relative compaction of backfill from bottom of backfill to a level of 2 feet below finish subgrade, and obtain minimum of 95 percent relative compaction of backfill in top 2 feet below finish subgrade, in areas to receive concrete, asphalt-concrete, aggregate base, or other non-vegetative surface improvement.
- G. Obtain minimum of 85 percent relative compaction of backfill in areas to receive sod, other vegetation, or bare soil.

3.08 FIELD QUALITY CONTROL:

- A. Field inspection and testing will be performed as per Section 01 40 00 – Quality Requirements.
- B. Compaction testing of bedding and backfill will be performed in accordance with ASTM D 1557.
- C. After cleaning per Section 3.04 A, each section of sewer constructed shall be tested in accordance with acceptable “Low Pressure Air Test for Sanitary Sewers” methods such as presented in the Journal of Sanitary Engineering, Division ASCE, April 1964.
- D. Internal Inspection: Upon completion of construction and prior to final inspection, the contractor shall clean the entire new pipeline of all dirt and debris. Sewer pipes shall be cleaned by the controlled balling method.

END OF SECTION

RSUSD - NEW KINDERGARTEN PROJECT

SECTION 334000 - STORM DRAINAGE SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDED:

- A. Furnishing and installing storm drainage facilities, including pipe, cleanout, inlet structures and drain well.

1.02 RELATED SECTIONS:

- A. Section 31 14 00 – Soil Materials.
- B. Section 31 23 00 – Trench Excavation and Backfilling.
- C. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specifications sections, apply to the work of this section.

1.03 REFERENCES:

- A. ANSI/ASTM C76 – Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- B. ANSI/ASTM C443 – Joints for Circular Concrete Sewer and Culvert Pipe, using rubber gaskets.
- C. ANSI/ASTM C478 – Precast Reinforced Concrete Manhole Sections.
- D. California Test Method No. 216 (Dry Method).

1.04 SUBMITTALS:

- A. Certificates of compliance for material.
- B. Product Data: Provide data indicating pipe, accessories, and associated
- C. Manufacturer's Installation Instructions: Indicate special procedures required to install products supplied.

1.05 COORDINATION:

- A. Coordinate work with Owner personnel.
- B. Verify that the location of existing utilities have been indicated at work site by utility authorities and Owner personnel.

1.06 EXISTING UTILITIES:

- A. The Engineer has indicated on the plans the location of all known existing utility facilities within the work area. The location of said facilities shall be considered approximate only, until exposed by the Contractor.
- B. Service laterals have been shown where information was available. The location of said facilities shall be considered approximate only, until exposed by the Contractor.

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- C. Contractor shall verify all utilities within the work area, including using hand method. Contractor shall protect all existing utilities not designated to be removed.
- D. Maintain all existing utility mains and service lines in constant service during construction of the work.

1.07 PROJECT RECORD DOCUMENTS:

- A. Accurately record actual locations of utilities encountered.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Reinforced Concrete Pipe for pipe larger than 12": ANSI/ASTM C76, Class 4, with rubber gasket joints per ANSI/ASTM C443.
- B. Storm drainage sewer pipeline shall be polyvinyl chloride (PVC) pipe for storm sewer conforming to ASTM designation 3034, SDR 35 for pipe 12" or less.
- C. Cast in Place Concrete: Per Section 03 30 00.
- D. Reinforcement: Per Section 03 20 00.
- E. Mortar: Composed of one part, by weight, Portland cement (Type II low alkali per ASTM C150), 2 parts, by weight, sand, and water.
- F. Storm drain inlets: Not Used.
- G. Soil Fill for Concrete Pipe Bedding Envelope: Type B or C per Section 31 14 00 – Soil Material.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Verify site conditions. Locate, identify, and protect existing above and below grade utilities from damage.

3.02 PREPARATION:

- A. Protect all improvements not authorized for removal.
- B. Employ equipment and methods appropriate to the work site.
- C. Identify location of proposed storm drainage facilities to be constructed. Expose connection points to existing system.
- D. Protect excavated areas from drainage inflow, and provide drainage to all excavated areas. Dewater as necessary.
- E. Comply with safety requirements as they pertain to excavations, per Section 31 23 00/3.01C.

3.03 EXCAVATION:

- A. Excavate soil required to locate existing utilities and install the work, use hand method as necessary in congested area.
- B. Employ equipment and methods appropriate to the work site.
- C. Cut trenches just wide enough to enable installation and proper backfill and do not interfere with 45 degree bearing splay of foundations. When excavating through tree roots, cut roots by hand.
- D. Excavate trenches to provide the minimum cover required.
- E. Excavate trenches, pits, or holes bottoming in hardpan to a minimum of 6 inches below the grade for the bottom of the pipe and any couplings.
- F. In all trenches or excavation sites where a firm foundation is not encountered, such as soft, spongy, or otherwise unsuitable material, remove the material to a minimum of 12 inches, or to a depth determined by the Engineer, below the bottom of the proposed pipe or structure.
- G. Stockpile excavated material to be returned to trench adjacent thereto in location, which will not be detrimental to existing improvements, or pedestrian or vehicular traffic. Remove unsuitable or excess materials not being used, from site.

3.04 INSTALLATION AND BEDDING OF STORM DRAIN PIPE:

- A. Install the pipe and fittings to the lines and grades shown on the construction plans.
- B. Install pipe and fittings in accordance with the manufacturer's recommendations.
- C. Lay all pipe with bell end of pipe upgrade from structure to structure.
- D. Excavate suitable bell holes in the bedding material, so that the bells do not bear on the subgrade or bedding.
- E. Ensure that all joints are watertight.
- F. Bed concrete pipe in Type B or C soil envelope, and compact to a minimum of 85 percent relative compaction. Place and compact the bedding material under, around and over the pipe, filling the trench cavity and extending from the bottom of the trench (4 inches below the outside bottom of the pipe barrel) to a level 12 inches above the outside top of the pipe barrel.

3.05 INSTALLATION OF STORM DRAINAGE STRUCTURES AND APPURTENANCES:

- A. Install storm drainage structures as indicated on the construction plans, in accordance with the manufacturer's recommendations, and as specified herein.
- B. Construct cast-in-place concrete per Section 03 30 00.
- C. Key top of poured-in-place concrete bases for structures to receive the tongue of precast riser sections.
- D. Joint precast manhole and structure riser sections with a minimum thickness of ½ inch of mortar per Section 33 40 00/2-01G to make a watertight joint. Neatly point the inside and outside of the joint. Set sections plumb.

- E. Construct cleanout per detail drawing.

3.06 BACKFILLING TO FINISH GRADE AND FINISH GRADING:

- A. Backfill from bottom of the trench to pipe grade with Type B and C soil.
- B. After installation of pipes and appurtenances and backfill of pipe bedding material.
- C. Backfill trenches above pipe bedding material and to within 6 inches of finish subgrade with Type A, B, & C soils. Compact all soil backfill not exceeding 8 inches in uncompacted thickness. Maintain optimum moisture content of fill materials.
- D. Backfill final 6 inch thickness to finish subgrade in areas to receive concrete, asphalt-concrete, aggregate base, or other non-vegetative surface improvement, with Type B or C soils.
- E. Backfill final 6 inch thickness to finish subgrade in areas to receive sod, other vegetation, or bare soil with Type A soil.
- F. Obtain 85 percent relative compaction of backfill from bottom of backfill to a level of 2 feet below finish subgrade, and obtain minimum of 95 percent relative compaction of backfill in top 2 feet below finish subgrade, in areas to receive concrete, asphalt-concrete, aggregate base, or other non-vegetative surface improvement.
- G. Obtain minimum of 85 percent relative compaction of backfill in areas to receive sod, other vegetation, or bare soil.

3.07 TOLERANCES:

- A. Pipe laying tolerances:
 - 1. Above grade: Not to exceed 1/4 inch above planned grade.
 - 2. Below grade: Not to exceed 1/2 inch below planned grade.
 - 3. Alignment: Not to exceed 2 inches from planned alignment, if gradual and regular over a distance of 20 feet.
- B. Structure finish grade tolerance: Within 1/4 inch of planned grade, but must match adjacent improvements.

3.08 FIELD QUALITY CONTROL:

- A. Compaction testing of bedding and backfill will be performed in accordance with ASTM D 1557.
- B. If tests indicate work does not meet specified requirements, re-compact, or remove and replace, and retest.

END OF SECTION



GEOTECHNICAL ENGINEERING INVESTIGATION WITH GEOLOGIC HAZARDS EVALUATION

**PROPOSED CLASSROOM BUILDING
REEF-SUNSET UNIFIED SCHOOL DISTRICT
500 SOUTH FIRST AVENUE
AVENAL, CALIFORNIA**

**SALEM PROJECT NO. 1-220-0546
AUGUST 14, 2020**

PREPARED FOR:

**MR. ALAN MOK
ALAN MOK ENGINEERING
7415 N. PALM AVENUE, SUITE 101
FRESNO, CALIFORNIA 93711**

PREPARED BY:

**SALEM ENGINEERING GROUP, INC.
4729 W. JACQUELYN AVENUE
FRESNO, CA 93722
P: (559) 271-9700
F: (559) 275-0827
www.salem.net**



4729 W. Jacquelyn Avenue
Fresno, CA 93722
Phone (559) 271-9700
Fax (559) 275-0827

August 14, 2020

Project No. 1-220-0546

Mr. Alan Mok
Alan Mok Engineering
7415 N. Palm Avenue, Suite 101
Fresno, California 93711

**Subject: Geotechnical Engineering Investigation with
Geologic Seismic Hazards Evaluation**
PROPOSED CLASSROOM BUILDING
AVENAL ELEMENTARY SCHOOL
500 SOUTH FIRST AVENUE
AVENAL, CALIFORNIA 93204

Dear Mr. Mok:

At your request and authorization, SALEM Engineering Group, Inc. (SALEM) has prepared this Geotechnical Engineering Investigation and Geologic Seismic Hazards Evaluation Report for the Proposed Classroom Building located at 500 South First Avenue, within the property of existing Avenal Elementary School in Avenal, California.

The accompanying report presents our findings, conclusions, and recommendations regarding the geotechnical aspects of designing and constructing the project as presently proposed. In our opinion, the proposed project is feasible from a geotechnical viewpoint provided our recommendations are incorporated into the design and construction of the project.

We appreciate the opportunity to assist you with this project. Should you have questions regarding this report or need additional information, please contact the undersigned at (559) 271-9700.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

A handwritten signature in blue ink that reads 'Ahmad Dalqamouni'.

Ahmad Dalqamouni, Ph.D., M.CE
Geotechnical Project Engineer
Central / Northern California

A handwritten signature in blue ink that reads 'Dean B. Ledgerwood II'.

Dean B. Ledgerwood II, CEG
Northern California Geotechnical Manager
CEG 2613

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- Results of Liquefaction and Seismic Settlement Analysis

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**PROPOSED CLASSROOM BUILDING
REEF-SUNSET UNIFIED SCHOOL DISTRICT
500 SOUTH FIRST AVENUE
AVENAL, CALIFORNIA**

1. PURPOSE AND SCOPE

This report presents the results of our Geotechnical Engineering Investigation and Geologic Seismic Hazards Evaluation for the proposed construction of classroom building to be located at the Avenal Elementary School campus at 500 South First Avenue in Avenal, California (see Figure 1, Vicinity Map).

The purpose of our geotechnical engineering investigation was to conduct site observations, observe and sample the subsurface conditions encountered at the project site, and to provide conclusions and recommendations relative to the geotechnical aspects of constructing the project as presently proposed.

The recommendations presented herein are based on analysis of the data obtained and reviewed during the investigation and our experience with similar soil and geologic conditions.

If project details vary significantly from those described herein, SALEM should be contacted to determine the necessity for review and possible revision of this report. Earthwork and Pavement Specifications are presented in Appendix C. If text of the report conflict with the specifications in Appendix C, the recommendations in the text of the report have precedence.

2. SITE LOCATION AND DESCRIPTION

The proposed classroom is planned in the northern portion of the Avenal elementary school campus located at 500 South First Avenue, Avenal, California (see Site Plan, Figure 2). The area of the proposed building pad is bound to the north, south, and east by existing classroom buildings and to the west by playcourt areas. At the time of field reconnaissance, the areas of the proposed improvements included existing vacant small classroom building and library building, and two vacant small lots in between the mentioned buildings.

Google Earth imagery indicates the site lies at coordinates 36.0034 N, -120.1384 W, and a relative elevation 792 feet above mean sea level.

3. PROJECT DESCRIPTION

We understand that the project involves the construction a classroom building within the existing Avenal Elementary School campus located in Avenal, California. It our understanding that the existing vacant building will be removed to make way for the planned construction.

Based on information provided it is our understanding the proposed classroom building will be about 4,260 square-feet in plan view dimension. The anticipated construction will include wood or steel-framed or CMU wall construction supported on conventional shallow spread foundations and concrete slabs on grade.

Maximum column and wall loads for the proposed building are anticipated to be about 20 to 40 kips and 1 to 3 kips per linear foot, respectively. Maximum total and differential settlement is anticipated be 1 inch and ½ inch, respectively.

A site grading plan was not available at the time of preparation of this report. As the existing project area is essentially level, we anticipate that cuts and fills during earthwork will be around 1 to 2 feet to provide level building pads and positive site drainage. In the event that changes occur in the nature or design of the project, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions of our report are modified. The site configuration and locations of proposed improvements are shown on the Site Plan, Figure 2.

4. FIELD EXPLORATION

Our field exploration consisted of site surface reconnaissance and subsurface exploration. The exploratory test borings (B-1 and B-2) were drilled on July 23, 2020 in the area shown on the Site Plan, Figure 2. The test borings were advanced with 6-inch diameter solid-flight auger rotated by a truck-mounted CME-55 drill rig. The test borings were extended to a maximum depth of approximately 51.5 feet below existing grade. The location of the soil borings are depicted on Figure 2, Site Plan. A detailed discussion of our field investigation and exploratory boring logs are presented in Appendix A

The materials encountered in the test borings were visually classified in the field, and logs were recorded by a field engineer and stratification lines were approximated on the basis of observations made at the time of drilling. Visual classification of the materials encountered in the test borings were generally made in accordance with the Unified Soil Classification System (ASTM D2487). A soil classification chart and key to sampling is presented on the Unified Soil Classification Chart, in Appendix "A." The test boring logs are presented in Appendix "A." The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol. The location of the test borings were determined by measuring from features shown on the Site Plan, provided to us. Hence, accuracy can be implied only to the degree that this method warrants.

The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted.

Soil samples were obtained from the test borings at the depths shown on the test boring logs. The samples recovered were capped at both ends to preserve the samples at their natural moisture content; bag samples were recovered and placed in a sealed bag to preserve their natural moisture content. The borings were backfilled with soil cuttings after completion of the drilling.

5. LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory-testing program was formulated with emphasis on the evaluation of natural moisture, density, shear strength, consolidation potential, expansion index, Atterberg limit, resistivity, and gradation of the materials encountered.

In addition, chemical tests were performed to evaluate the corrosivity of the soils to buried concrete and metal. Details of the laboratory test program and the results of laboratory test are summarized in Appendix "B." This information, along with the field observations, was used to prepare the final boring logs in Appendix "A."

6. SOIL AND GROUNDWATER CONDITIONS

6.1 Subsurface Conditions

The subsurface soil conditions encountered appear typical of those found in the geologic region of the site. In general, the soils encountered in the test borings drilled consisted of soft to stiff sandy lean Clay and sandy silty Clay to depths of 25 feet BSG. The sandy silty clays were underlain by interbedded layers of medium dense clayey sand, and very stiff sandy clayey Silts, to the maximum depth explored of 51.5 feet BSG.

A consolidation test performed, the samples tested resulted in about 9.2 percent compressibility under a load of 8 kips per square foot. When wetted under a load of 2 kips per square foot, these sample exhibited about 2.2 percent collapse. A direct shear test resulted in an internal angle of friction of 33 degrees with 317 pound square foot value. Atterberg limits tests performed on two (2) near surface samples resulted in plasticity indexes of 12 and 16 with liquid limits values of 28 and 31. An Atterberg limits test performed on a sample around 8.5 to 10 feet BSG resulted in a plasticity index of 7 and liquid limits value of 23. An expansion index test performed on a near surface soil sample resulted in an expansion index of 17.

Soil conditions described in the previous paragraphs are generalized. Therefore, the reader should consult exploratory boring logs included in Appendix A for soil type, color, moisture, consistency, and USCS classification of the materials encountered at specific locations and elevations.

6.2 Groundwater

The test boring locations were checked for the presence of groundwater during and after the drilling operations. Free Groundwater was not encountered within the depth of exploration, 51.5 feet below site grade (BSG). Based on review of well data provided on the Department of Water Resources Water Data Library website (<http://www.wdl.water.ca.gov/>), State Well Number (359714N1201027W001) located about 2 miles southeast of the project site, reported a historical high groundwater depth of 234 feet BSG in December 28 1994.

It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, localized pumping, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

6.3 Soil Corrosion Screening

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete and the soil. The 2014 Edition of ACI 318 (ACI 318) has established criteria for evaluation of sulfate and chloride levels and how they relate to cement reactivity with soil and/or water. A soil sample was obtained from the project site and was tested for the evaluation of the potential for concrete deterioration or steel corrosion due to attack by soil-borne soluble salts and soluble chloride. The water-soluble sulfate concentration in the saturation extract from the soil sample was detected to be less than 50 mg/kg.

ACI 318 Tables 19.3.1.1 and 19.3.2.1 outline exposure categories, classes, and concrete requirements by exposure class. ACI 318 requirements for site concrete based upon soluble sulfate are summarized in Table 6.3 below.

TABLE 6.3
WATER SOLUBLE SULFATE EXPOSURE REQUIREMENTS

Water Soluble Sulfate (SO₄) in Soil, Percentage by Weight	Exposure Severity	Exposure Class	Maximum w/cm Ratio	Minimum Concrete Compressive Strength	Cementations Materials Type
<0.005	Not Applicable	S0	N/A	2,500 psi	No Restriction

The water-soluble chloride concentration detected in saturation extract from the soil samples was 15 mg/kg. In addition, testing performed on a near surface soil resulted in a minimum resistivity value of 2,892 ohm-centimeters. Based on the results of resistivity test, the soils would be considered to have a “Highly corrosive” potential to buried metal objects (per National Association of Corrosion Engineers, Corrosion Severity Ratings)

It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, applicable manufacturer’s recommendations for corrosion protection of buried metal pipe be closely followed. Additional corrosion testing for minimum resistivity may need to be performed if required by the pipe manufacturer.

7. GEOLOGIC AND SEISMIC HAZARD EVALUATIONS

7.1 Geologic Setting

The project site is in western portion San Joaquin Valley, which is a topographic and structural basin that is bounded on the east by the Sierra Nevada geomorphic province and on the west by the Coast Ranges geomorphic province. The San Joaquin (Great Valley Geomorphic Province) is an alluvial plain about 50 miles wide and 400 miles long in the central part of California (California Geologic Survey (CGS) Note 36). The Great Valley is an elongated trough in which sediments have been deposited almost continuously for the last approximately 160 million years (Jurassic). The Great Valley reaches depths of about 30,000 feet at its southern end, and is filled with a large volume of sediments of Mesozoic through Recent age. Recent alluvium covers nearly the entire valley floor, and has largely been derived from the adjacent Sierra Nevada except in the westernmost portions of the valley floor.

The Sierra Nevada, a fault block dipping gently southwestward, is composed of igneous and metamorphic rocks of pre-Tertiary age that comprise the basement complex beneath the Valley. The Coast Ranges contain folded and faulted sedimentary rocks of Mesozoic and Cenozoic age, which are similar to those rocks that underlie the Valley at depth and non-conformably overlie the basement complex; gently dipping to nearly horizontal sedimentary rocks of Tertiary and Quaternary age overlie the older rocks. These younger rocks are mostly of continental origin, and in the west-Fresno area, they were derived from the Sierra Nevada. The Coast Ranges evolved as a result of folding, faulting and accretion of diverse geologic terrains. They are composed chiefly of sedimentary and metamorphic rocks that are sharply deformed into complex structures. The Coast Ranges are broken by numerous faults, the San Andreas Fault being the most notable feature.

The subject site is mapped by the (Geologic Map of the Avenal and La Cima quadrangles, Fresno and Kings Counties, California¹) as underlain by Quaternary age (Holocene Sediments) alluvial gravel, sand and clay deposited from valley stream channels (Qa). The sediments in the project area exposed during the subsurface exploration indicate the surface soils consist of various admixtures of sandy Clay, sandy silty Clay, sandy Silts and silty Sands with little gravel percentages.

A regional geologic map is included as Figure No. 3 at the end of this report. Based on the relatively flat nature of the project and uniform geologic conditions, site specific geologic cross sections are not determined necessary.

7.2 Tectonics and Seismicity

Numerous active and potentially active faults are located in the site region and contribute to design seismic ground motion estimates. An "active fault" is defined, for the purpose of this evaluation, as a fault that has had surface displacement within the Holocene age (about the last 11,700 years).

To determine the distance of known active faults within 100 miles of the site, we used the United States Geological Survey (USGS) web-based application *2008 National Seismic Hazard Maps - Fault Parameters*. Site latitude is 36.0034° North; site longitude is -120.1383° West. The ten closest active faults are summarized below in Table 7.2. Please refer to Figure 4 for a regional fault map that shows these features.

**TABLE 7.2
REGIONAL FAULT SUMMARY**

Fault Name	Distance to Site (miles)	Maximum Earthquake Magnitude, M_w
Great Valley 14 (Kettleman Hills)	7.16	7.2
Great Valley 13 (Coalinga)	10.12	7.1
S. San Andreas;PK+CH+CC+BB+NM	18.16	7.7
S. San Andreas;CH+CC+BB+NM	19.59	7.7
San Andreas fault - creeping segment	23.73	N/A
San Juan	24.02	7.1
Great Valley 12	26.04	6.4
Great Valley 11	38.07	6.6
Rinconada	41.58	7.5
S. San Andreas;CC+BB+NM+SM+NSB+SSB	49.91	7.9

The faults tabulated above and numerous other faults in the region are sources of potential ground motion. However, earthquakes that might occur on other faults throughout California are also potential generators of significant ground motion and could subject the site to intense ground shaking.

¹ Dibblee, T.W., and Minch, J.A., 2006, Geologic map of the Avenal and La Cima quadrangles, Fresno and Kings Counties, California

7.3 Geologic Hazards Evaluation

The potential geologic hazards of flooding, landslides, and volcanic activity are described in the following subsections

7.3.1 Flooding

Based on FEMA Flood Insurance Rate Map No. 06031C0395C dated June 16, 2009, the subject site area is partially labeled other flood areas Zone X, which designates areas of minimal flood hazard that are outside of a Special Flood Hazard Area (SFHA) and is in an area of 0.2% annual chance flood; area of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood (Figure 6).

7.3.2 Landslides

The site vicinity is flat. There are no known landslides at the site, nor is the site in the path of any known or potential landslides. We do not consider the potential for a landslide to be a hazard to this project.

7.3.3 Volcanic Activity

California includes six regions with a history of late Pleistocene and Holocene volcanic eruptions that are subject to hazards from future eruptions (Miller, 1989). Of these six regions, the Mono Lake-Long Valley area is the closest. This area is located about 132 miles northeast of the site. Based on review of Plate 1, Miller 1989, the subject site is not located within any designated volcanic hazard zones.

Based on the distance of volcanic hazards from the site, the prospect for volcanic hazards to impact the site during the design life of the facility is considered low.

8. OTHER GEOLOGIC HAZARDS

8.1 Expansive Soils

One of the potential geotechnical hazards evaluated at this site is the expansion potential of the near surface soils. Expansive soils experience shrink and swell due to moisture content fluctuations throughout the dry and wet season. If not addressed, the potential for shrinkage and heave would have an impact on foundations and lightly loaded slabs. The potential for damage to slabs-on-grade and foundations supported on expansive soils can be reduced by placing non-expansive fill below the slabs-on-grade.

Based on the near surface soils encountered and our experience in the near site vicinity, the near surface soils are considered to have very low expansion potential (EI=17). Thus, the potential to damage due to heave of expansive soils is low and is not of a major concern for the site.

8.2 Corrosion Protection

The risk of corrosion of construction materials relates to the potential for soil-induced chemical reaction. Corrosion is a naturally occurring process whereby the surface of a metallic structure is oxidized or reduced to a corrosion product such as iron oxide (i.e., rust).

Testing performed on a near surface soil resulted in a minimum resistivity value of 2,892 ohm-centimeters. Based on the results, these soils would be considered to have a “highly corrosive” potential to buried metal objects (per National Association of Corrosion Engineers, Corrosion Severity Ratings).

8.3 Sulfate Attack of Concrete

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete and the soil. The 2014 Edition of ACI 318 (ACI 318) has established criteria for evaluation of sulfate levels and how they relate to cement reactivity with soil and/or water. A soil sample was obtained from the project site and was tested for the evaluation of the potential for concrete deterioration. ACI 318 Tables 19.3.1.1 and 19.3.2.1 outline exposure categories, classes, and concrete requirements by exposure class.

The water-soluble sulfate concentration in the saturation extract from the soil sample was detected to be less than 50 mg/kg (<0.005 Percent by weight). Therefore, the potential for sulfate attack on concrete is considered negligible.

9. CONDITIONAL GEOLOGIC HAZARDS:

Conditional geologic hazards, as identified in section 31 of California Geological Survey Note 48, are discussed in the following subsections.

9.1 Tsunamis and Seiches

The site is not located within a coastal area. Therefore, tsunamis (seismic sea waves) are not considered a significant hazard at the site. Seiches are large waves generated in enclosed bodies of water in response to ground shaking. No major water-retaining structures are located immediately up gradient from the project site. Flooding from a seismically-induced Seiche is considered unlikely.

9.2 Hazardous Materials

Hazardous materials such as methane gas, hydrogen-sulfide gas and tar seeps are not known to be present in the project area and are not considered to be a concern at the subject site.

9.3 Radon Gas

Based on review of the EPA Map of Radon Zones ² the site and Avenal area is located in an area identified as having indoor radon screening levels ranging from 2 to 4 pCi/L. Given the site is expected to experience less than 4pCi/L. The CDPH¹ has conducted around 34 indoor tests for Radon in the zipcode area of the site and found 3 tests are above 4pCi/L, these tests are more than the recommended EPA’s action level for radon exposure. Provided the buildings are constructed with adequate ventilation, radon exposure is not considered a concern.

9.4 Naturally Occurring Asbestos

Asbestos commonly occurs in soil and ultramafic rocks such as serpentinite throughout California. Ultramafic rocks are scattered throughout much of the Sierra Nevada Mountain and the Coast Range regions. Based on review of the Open-File Report 2000-19, titled A General Location Guide for Ultramafic

¹<https://www.cdph.ca.gov/Programs/CEH/DRSEM>

² <https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap>

Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos, prepared by the State of California Department of Conservation, Division of Mines and Geology, dated August, 2000, ultramafic rock is identified 10 miles southwest of the site. Based on the cited literature and our site observations, it is our opinion that the potential to encounter near surface naturally occurring asbestos containing rock at the site is very low.

9.5 Hydrocollapse

Collapsible soils typically consist of loose, dry, low-density soils that, when wetted, will experience settlement/consolidation. Based on the results of testing performed on a relatively undisturbed near surface soil sample, when wetted under a load of 2 kips per square foot these soils exhibited around 2.2 percent collapse. Based on the results of the testing performed, provided the recommendations to support foundations on a uniform layer of engineered fill are followed, the potential for hydrocollapse is not a concern for the proposed construction.

9.6 Regional Subsidence

Based on our review of an online map published by California Water Science Center³, the site is not located in an area of recorded subsidence.

10. SEISMIC HAZARDS

The potential for fault ground rupture, seismic ground shaking and seismic coefficients/earthquake spectral response acceleration design values, and liquefaction and seismic settlement are described in the following subsections.

10.1 Active Faulting and Surface Fault Rupture

Based on mapping and historical seismicity, the seismicity of the Avenal Area has been generally considered low by the scientific community. The site is not within a currently established State of California Earthquake Fault Zone for surface fault rupture hazards nor within an Alquist-Priolo Earthquake Fault (Special Studies) Zone, therefore, a site specific fault study investigation by an Engineering Geologist is not required. No active faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low.

The nearest faults to the project site are associated with the Great Valley Fault system located approximately 7.2 miles west from the site. There are no known active fault traces in the immediate project vicinity.

A map depicting the major active faults in the vicinity of the site is included on Figure No. 4 at the end of this report. Considering the distance to the nearest known active fault, the potential for surface fault rupture at the site due to a known active fault is considered low.

³ https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html

10.2 Historic Seismic Activity

The general area of the site has experienced recurring seismic activity. Based on historical earthquake data obtained from the U.S. Geological Survey's earthquake database system, approximately 185 historical earthquakes with magnitude 4.5 or greater have been recorded from 1900 through August 14, 2020 within about 50 miles of the site. A map showing the location of the project site with relation to the approximate historical earthquake epicenter locations and magnitude category is presented on Figure No. 5 at the end of this report.

The largest earthquake event (estimated magnitude of 6.7) found during the search occurred north of Coalinga on May 2, 1982, with a reported location of approximately 18.6 miles northwest of the site with a peak ground acceleration of 0.33g reported in the vicinity of the site. The nearest magnitude earthquake identified within a 50 mile search radius was the 4.3 magnitude earthquake, which occurred on August 7, 1985, approximately 0.7 miles northwest of the site.

10.3 Design Seismic Ground Motion Parameters and Site Class

Seismic coefficients and spectral response acceleration values were developed based on the 2019 California Building Code (CBC). The CBC methodology for determining design ground motion values is based on the Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps, which incorporate both probabilistic and deterministic seismic ground motion.

Based on the 2019 CBC, a Site Class E represents the on-site soil conditions with standard penetration resistance, N-values, averaging less than 15 blows per foot in the upper 100 feet below site grade. A table providing the recommended design acceleration parameters for the project site, based on a Site Class E designation, is included in section 11.6 of this report.

Based on Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps, the estimated design peak ground acceleration adjusted for site class effects (PGA_M) was determined to be 0.7 g (based on both probabilistic and deterministic seismic ground motion).

10.4 Liquefaction and Seismic Settlement

Soil liquefaction is a state of soil particles suspension caused by a complete loss of strength when the effective stress drops to zero. Liquefaction normally occurs under saturated conditions in soils such as sand in which the strength is purely frictional. Primary factors that trigger liquefaction are: moderate to strong ground shaking (seismic source), relatively clean, loose granular soils (primarily poorly graded sands and silty sands), and saturated soil conditions (shallow groundwater). Due to the increasing overburden pressure with depth, liquefaction of granular soils is generally limited to the upper 50 feet of a soil profile. However, liquefaction has occurred in soils other than clean sand.

In general, the soils encountered generally consisted of soft to stiff sandy lean Clay and sandy silty Clay to depths of 25 feet BSG. The sandy silty clays were underlain by interbedded layers of medium dense clayey sand, and very stiff sandy clayey Silts, to the maximum depth explored of 51.5 feet BSG. Free groundwater was not encountered during our field exploration. Based on review of well data provided on the Department of Water Resources Water Data Library website (<http://www.wdl.water.ca.gov/>), State Well Number (359714N1201027W001) located 1.90 miles southeast of the project site, reported a historical high groundwater depth of 234 feet BSG in December 28 1994.

A seismic hazard, which could cause damage to the proposed development during seismic shaking, is the post-liquefaction settlement of the liquefied sands. According to the State of California, Seismic Hazard Zonation Program, the site is NOT located within the potential liquefaction zone.

Based on the lack of historic groundwater in the upper 50 feet BSG liquefaction is not a concern for the site. A dry seismic settlement analysis was performed using LiquefyPro computer program (version 5.9c) developed by Civiltech. For the analysis, a maximum earthquake magnitude of 7.5 M_w (determined from USGS Unified Hazard Tool, Dynamic Conterminous U.S. 2014 Deaggregation), a design peak horizontal ground surface acceleration of 0.7g (PGA_m), a groundwater depth of greater than 50 feet, and data obtained from test boring B-1 were utilized for the dry seismic settlement analysis. Based on the lack of groundwater anticipated in the upper 50 feet and relatively clayey nature of the soils encountered, considering Table 7.1 of the Recommended Procedures of Implementation of DMG SP117 a factor of safety of 1.1 was considered for the dry seismic settlement analysis. Based on our analysis the potential for dry seismic settlement, the total dry seismic induced settlement is anticipated to be around 1.5 inches and differential dry seismic settlement of about 0.75 inch in 40 feet.

10.5 Lateral Spreading

Lateral spreading is a phenomenon in which soils move laterally during seismic shaking and is often associated with liquefaction. The amount of movement depends on the soil strength, duration and intensity of seismic shaking, topography, and free face geometry. Due to the lack of groundwater near the surface, relatively flat nature of the site and low liquefaction potential we judge the likelihood of lateral spreading to be low.

11. CONCLUSIONS AND RECOMMENDATIONS

11.1 General

- 11.1.1 Based upon the data collected during this investigation, and from a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed construction of improvements at the site as planned, provided the recommendations contained in this report are incorporated into the project design and construction. Conclusions and recommendations provided in this report are based on our review of available literature, analysis of data obtained from our field exploration and laboratory testing program, and our understanding of the proposed development at this time.
- 11.1.2 In general, the soils encountered generally consisted of soft to stiff sandy lean Clay and sandy silty Clay to depths of 25 feet BSG. The sandy silty clays were underlain by interbedded layers of medium dense clayey sand, and very stiff sandy clayey Silts, to the maximum depth explored of 51.5 feet BSG. Free groundwater was not encountered during our field exploration.
- 11.1.3 The near surface soils have moderate compressibility characteristics and moderate collapse potential. Based on the mixture of the soils encountered and laboratory testing of the upper soils have a very low expansive potential ($EI=17$).
- 11.1.4 Based on the subsurface conditions at the site and the anticipated structural loading, we anticipate that the proposed improvements may be supported using conventional shallow foundations provided that the recommendations presented herein are incorporated in the design and construction of the project.

- 11.1.5 Provided the site is graded in accordance with the recommendations of this report and foundations constructed as described herein, we estimate that total settlement due to static loads utilizing conventional shallow foundations of about 1-inch and corresponding differential static of ½ inch in 40 feet.
- 11.1.6 Based on our analysis an estimated dry seismic settlement of 1.5 inches total and 0.75 inches differential in 40 feet would be anticipated due a design level seismic event.
- 11.1.7 Based on the chemistry testing performed, the near surface soils have ‘negligible’ potential for sulfate attack on concrete and are considered to be highly corrosive to buried metal objects.
- 11.1.8 All references to relative compaction and optimum moisture content in this report are based on ASTM D 1557 (latest edition).
- 11.1.9 We should be retained to review the project plans as they develop further, provide engineering consultation as-needed, and perform geotechnical observation and testing services during construction.

11.2 Surface Drainage

- 11.2.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change to important engineering properties. Proper drainage should be maintained at all times.
- 11.2.2 The ground immediately adjacent to foundations shall be sloped away from the building at a slope of not less than 5 percent for a minimum distance of 10 feet. Impervious surfaces within 10 feet of building foundations shall be sloped a minimum of 2 percent away from the building and drainage gradients maintained to carry all surface water to collection facilities and off site. These grades should be maintained for the life of the project. Ponding of water should not be allowed adjacent to the structures. Over-irrigation within landscaped areas adjacent to the structures should not be performed.
- 11.2.3 Roof drains should be installed with appropriate downspout extensions out-falling on splash blocks so as to direct water a minimum of 5 feet away from the structures or be connected to the storm drain system for the development.

11.3 Site Grading

- 11.3.1 A representative of our firm should be present during all site clearing and grading operations to test and/or observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Geotechnical Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section as well as other portions of this report.

- 11.3.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer and geotechnical engineer in attendance.
- 11.3.3 Site demolition activities shall include removal of all surface obstructions not intended to be incorporated into final site design. In addition, undocumented fill, underground buried structures, and/or utility lines encountered during demolition and construction should be properly removed and the resulting excavations backfilled with approved Engineered Fill. After demolition activities, it is recommended that disturbed soils be removed and/or replaced with compacted engineered fill soils.
- 11.3.4 Site preparation should begin with removal of existing surface/subsurface structures, underground utilities (as required), disturbed soil, any existing uncertified/undocumented fill, and debris. Excavations or depressions resulting from site clearing operations, or other existing excavations or depressions, should be restored with Engineered Fill in accordance with the recommendations of this report. It is the expected demolition of the existing improvements may disturb the upper subgrade soils. Any disturbed subgrade, undocumented fill materials or soft/loose unsuitable materials encountered during grading should be removed and replaced as engineered fill. The actual depth of the over-excavation should be determined by our field representative during construction
- 11.3.5 Surface vegetation consisting of grasses and other similar vegetation should be removed by stripping to a sufficient depth to remove organic-rich topsoil. The upper 2 to 4 inches of the soils containing, vegetation, roots and other objectionable organic matter encountered at the time of grading should be stripped and removed from the surface. Deeper stripping may be required in localized areas. The stripped vegetation will not be suitable for use as Engineered Fill or within 5 feet of building pads. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas or exported from the site.
- 11.3.6 Removal of trees and loose disturbed soils from existing site conditions will be an integral part of the site preparation. Existing trees should be removed and their root systems should be thoroughly cleared of root balls as well as isolated roots greater than ¼-inch in diameter. The root system removal may disturb a significant quantity of soil. Following tree removal, all loose and disturbed soil should be removed from the tree wells. Any areas or pockets of soft or loose soils, void spaces made by burrowing animals, undocumented fill, or other disturbed soil (i.e. soil disturbed by root removal) that are encountered, should be excavated to expose approved firm native material. Care should be taken during site grading to mitigate (e.g. excavate and compact as engineered fill) all soil disturbed by demolition and tree removal activities
- 11.3.7 Structural building pad areas and over-build zone should be considered as areas extending a minimum of 5 feet horizontally beyond the outside dimensions of buildings, including footings and non-cantilevered overhangs carrying structural loads.
- 11.3.8 To provide uniform support for the proposed building, it is recommended that over-excavation extend to at least 24 inches below preconstruction site grade, 18 inches below foundations, or to the depth required to remove any undocumented fills or loose soils, whichever is greater. The resulting bottom of over-excavation shall be scarified to a minimum depth of at least 12 inches, worked until uniform and free from large clods, moisture-conditioned to at least 1 percent above

optimum moisture, and compacted to 90 percent of the maximum density. The horizontal limits of the over-excavation should extend throughout the building over-build zone, laterally to a minimum of 5 feet beyond the outer edges of the proposed footings

- 11.3.9 Interior slabs on grade should be supported on a minimum of 4 inches of Class 2 aggregate base compacted to 95 percent relative compaction, over the depth of engineered fill recommended below foundations.
- 11.3.10 Areas of proposed lightly loaded shallow spread foundations (i.e. retaining walls, screen walls, etc.) should be over-excavated to minimum depths of one (1) foot below existing grade, to the bottom of proposed footing bottom, or depth required to remove undocumented fills, whichever is deeper. The over-excavation should also extend laterally to a minimum of 5 feet beyond the outer edges of the proposed footings. The resulting bottom of over-excavation shall be scarified to a minimum depth of at least 12 inches, worked until uniform and free from large clods, moisture-conditioned to at least 1 percent above optimum moisture, and compacted to a minimum of 90 percent of the maximum density.
- 11.3.11 Areas of exterior concrete slabs on grade located outside the building pad over-build zone, should be prepared by scarification of the upper 12 inches below existing grade or 12 inches below the bottom of the recommended aggregate base section, whichever is greater. The zone of subgrade preparation should extend a minimum of 3 feet beyond these improvements. These soils should be moisture conditioned to at least 1 percent above optimum and compacted as engineered fill.
- Exterior slabs on grade should be supported on a minimum of 4 inches of Class 2 aggregate base compacted to 95 percent relative compaction over subgrade soils prepared as recommended above. As an alternative, if the School District is willing to accept additional risk for distress to exterior slabs, slabs on grade located outside the building pad may be supported directly over compacted subgrade soils as recommended above.
- 11.3.12 Areas to receive engineered fill outside the building pad over-build zone, should be prepared by scarification of the upper 12 inches below existing grade or 12 inches below the recommended base section, whichever is greater. These soils should be moisture conditioned to slightly above optimum and compacted as engineered fill.
- 11.3.13 An integral part of satisfactory fill placement is the stability of the placed lift of soil. If placed materials exhibit excessive instability as determined by a SALEM field representative, the lift will be considered unacceptable and shall be remedied prior to placement of additional fill material. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.
- 11.3.14 The most effective site preparation alternatives will depend on site conditions prior to grading. We should evaluate site conditions and provide supplemental recommendations immediately prior to grading, if necessary.
- 11.3.15 We do not anticipate groundwater or seepage to adversely affect construction if conducted during the drier months of the year (typically summer and fall). However, groundwater and soil moisture conditions could be significantly different during the wet season (typically winter and spring) as surface soil becomes wet; perched groundwater conditions may develop. Grading during this time

period will likely encounter wet materials resulting in possible excavation and fill placement difficulties. Project site winterization consisting of placement of aggregate base and protecting exposed soils during construction should be performed. If the construction schedule requires grading operations during the wet season, we can provide additional recommendations as conditions warrant.

- 11.3.16 Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material or placement of crushed rocks or aggregate base material; or mixing the soil with an approved lime or cement product.

The most common remedial measure of stabilizing the bottom of the excavation due to wet soil condition is to reduce the moisture of the soil to near the optimum moisture content by having the subgrade soils scarified and aerated or mixed with drier soils prior to compacting. However, the drying process may require an extended period of time and delay the construction operation. To expedite the stabilizing process, crushed rock may be utilized for stabilization provided this method is approved by the owner for the cost purpose.

If the use of crushed rock is considered, it is recommended that the upper soft and wet soils be replaced by 6 to 24 inches of $\frac{3}{4}$ -inch to 1-inch crushed rocks. The thickness of the rock layer depends on the severity of the soil instability. The recommended 6 to 24 inches of crushed rock material will provide a stable platform. It is further recommended that lighter compaction equipment be utilized for compacting the crushed rock. All open graded crushed rock/gravel should be fully encapsulated with a geotextile fabric (such as Mirafi 140N) to minimize migration of soil particles into the voids of the crushed rock. Although it is not required, the use of geogrid (e.g. Tensar BX 1100, BX 1200 or TX 160) below the crushed rock will enhance stability and reduce the required thickness of crushed rock necessary for stabilization.

Our firm should be consulted prior to implementing remedial measures to provide appropriate recommendations.

11.4 Soil and Excavation Characteristics

- 11.4.1 Based on the soil conditions encountered in our borings, the onsite soils can be excavated with moderate excavation equipment, particularly for trenches.
- 11.4.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable Occupational Safety and Health Administration (OSHA) rules and regulations to maintain safety and maintain the stability of adjacent existing improvements. Temporary excavations are further discussed in a later Section of this report.
- 11.4.3 The near surface soils identified as part of our investigation are, generally, moist due to the absorption characteristics of the soil. Earthwork operations may encounter very moist unstable soils which may require removal to a stable bottom. Exposed native soils exposed as part of site grading operations shall not be allowed to dry out and should be kept continuously moist prior to placement of subsequent fill.

11.5 Materials for Fill

- 11.5.1 On-site soils are suitable for use as general Engineered Fill, provided they do not contain deleterious matter, organic material, or fragments material larger than 3 inches in maximum dimension.
- 11.5.2 Imported Non-Expansive Engineered Fill soil, should be well-graded, very low-to-non-expansive slightly cohesive silty sand or sandy silt. This material should be approved by the Engineer prior to use and should typically possess the soil characteristics summarized below in Table 11.5.2.

TABLE 11.5.2
IMPORT FILL REQUIREMENTS

Percent Passing 3-inch Sieve	100
Percent Passing No.4 Sieve	75-100
Percent Passing No 200 Sieve	15-40
Maximum Plasticity Index	15
Maximum Organic Content	3% by Weight
Maximum Expansion Index (ASTM D4829)	20

Prior to importing fill, the Contractor shall submit test data that demonstrates that the proposed import complies with the recommended criteria for both geotechnical and environmental compliance. Also, prior to being transported to the site, the import material shall be certified by the Contractor and the supplier (to the satisfaction of the School District) that the soils do not contain any environmental contaminants regulated by local, state or federal agencies having jurisdiction. This certification shall consist of, as a minimum, analytical data specific to the source of the import material in accordance with the Department of Toxic Substances Control, "Informational Advisory, Clean Imported Fill Material," dated October 2001. The list of constituents to be tested for the fill source shall be submitted to FUSD for review and approval prior to the Contractor testing the fill. Contractors should provide a minimum of 14 working days after sample collection to complete the DTSC and geotechnical testing.

- 11.5.3 All Engineered Fill (including scarified ground surfaces and backfill) should be placed in lifts no thicker than will allow for adequate bonding and compaction (typically 6 to 8 inches in loose thickness).
- 11.5.4 On-Site soils used as engineered fill soils should moisture conditioned to at least 1 percent above optimum moisture content, and compacted to at least 90 percent relative compaction.
- 11.5.5 Import Engineered Fill, if selected, should be placed, moisture conditioned to slightly above optimum moisture content, and compacted to at least 92 percent relative compaction.
- 11.5.6 The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the Contractor, since they have complete control of the project site.

- 11.5.7 Environmental characteristics and corrosion potential of import soil materials should also be considered.
- 11.5.8 Proposed import materials should be sampled, tested, and approved by SALEM prior to its transportation to the site.
- 11.5.9 Aggregate base material should meet the requirements of a Caltrans Class 2 Aggregate Base. The aggregate base material should conform to the requirements of Section 26 of the Standard Specifications for Class 2 material, ¾-inch or 1½-inches maximum size. The aggregate base material should be compacted to a minimum relative compaction of 95 percent based ASTM D1557. The aggregate base material should be spread in layers not exceeding 6 inches and each layer of aggregate material course should be tested and approved by the Soils Engineer prior to the placement of successive layers

11.6 Seismic Design Criteria

- 11.6.1 For seismic design of the structures, and in accordance with the seismic provisions of the 2019 CBC, our recommended parameters are shown below. These parameters were determined using California's Office of Statewide Health Planning and Development (OSHPD) (<https://seismicmaps.org/>) in accordance with the 2019 CBC. The Site Class was determined based on the soils encountered during our field exploration. It is our understanding that the Structural Engineer will utilize code exceptions listed under 11.4.8. Therefore, a site specific ground motion hazard analysis would not be required.

TABLE 11.6.1
2019 CBC SEISMIC DESIGN PARAMETERS

Seismic Item	Symbol	Value	2010 ASCE 7 or 2019 CBC Reference
Site Coordinates (Datum = NAD 83)		36.0034 Lat -120.13830 Lon	
Site Class	--	E	ASCE 7 Table 20.3
Soil Profile Name	--	Soft Clay Soil	ASCE 7 Table 20.3
Risk Category	--	II	CBC Table 1604.5
Site Coefficient for PGA	F _{PGA}	1.1	ASCE 7 Table 11.8-1
Peak Ground Acceleration (adjusted for Site Class effects)	PGA _M	0.7 g	ASCE 7 Equation 11.8-1
Seismic Design Category	SDC	D	ASCE 7 Table 11.6-1 & 2
Mapped Spectral Acceleration (Short period - 0.2 sec)	S _S	1.535 g	CBC Figure 1613.3.1(1-6)
Mapped Spectral Acceleration (1.0 sec. period)	S ₁	0.526 g	CBC Figure 1613.3.1(1-6)
Site Class Modified Site Coefficient	F _a	1.2*	CBC Table 1613.3.3(1)
Site Class Modified Site Coefficient	F _v	2.148*	CBC Table 1613.3.3(2)

Seismic Item	Symbol	Value	2010 ASCE 7 or 2019 CBC Reference
MCE Spectral Response Acceleration (Short period - 0.2 sec) $S_{MS} = F_a S_s$	S_{MS}	1.842 g*	CBC Equation 16-37
MCE Spectral Response Acceleration (1.0 sec. period) $S_{M1} = F_v S_1$	S_{M1}	1.130 g*	CBC Equation 16-38
Design Spectral Response Acceleration $S_{DS} = \frac{2}{3} S_{MS}$ (short period - 0.2 sec)	S_{DS}	1.130 g*	CBC Equation 16-39
Design Spectral Response Acceleration $S_{D1} = \frac{2}{3} S_{M1}$ (1.0 sec. period)	S_{D1}	0.753 g*	CBC Equation 16-40
Short Period Transition Period (S_{D1}/S_{DS}), Seconds	T_s	0.667	ASCE 7-16, Section 11.4.6
Long Period Transition period (seconds)	T_L	12	ASCE 7-16, Figures 22-14 through 22-17

Note: * Determined per ASCE Table 11.4.8 for use in calculating T_s only.

Site Specific Ground Motion Analysis was not included in the scope of this investigation. Per ASCE 11.1.48, Structures on Site Class E, with S_s greater than or equal to 1.0 may require Site Specific Ground Motion Analysis. However, a site specific ground motion analysis may not be required based on Exceptions listed in ASCE 11.4.8. The Structural Engineer should verify whether Exception No. 1 and 3 of ASCE 7-16, Section 11.4.8 is valid for the site. In the event a site specific ground motion analysis is required, SALEM should be contacted for these services.

- 11.6.2 Conformance to the criteria in the above table for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

11.7 Shallow Foundations

- 11.7.1 The site is suitable for use of conventional shallow foundations consisting of continuous footings and isolated pad footings supported on engineered fill soils prepared in accordance with Section 11.3 of this report. Shallow foundations supported on engineered fill as recommended in this report may be designed based on total and differential static settlement of 1 inch and ½ inch in 40 feet, respectively.
- 11.7.2 The bearing wall footings considered for the proposed classroom building should be continuous with a minimum width of 12 inches and extend to minimum depths of 18 inches below the lowest adjacent grade. Isolated column footings should have a minimum width of 15 inches and extend a minimum depth of 18 inches below the lowest adjacent grade.
- 11.7.3 Lightly loaded foundations for screen walls, retaining walls, etc., should have a minimum width of 12 inches and minimum depth of 12 inches below adjacent grade.
- 11.7.4 Footing concrete should be placed into neat excavation. The footing bottoms shall be maintained free of loose and disturbed soil.

- 11.7.5 Footings proportioned as recommended above may be designed for the maximum allowable soil bearing pressures shown in the table below.

Loading Condition	Allowable Bearing
Dead-Plus-Live Load	2,000 psf
Total Load, Including Wind or Seismic Loads	2,660 psf

- 11.7.6 Resistance to lateral footing displacement can be computed using an allowable coefficient of friction factor of 0.31 acting between the base of foundations and the supporting native subgrade.
- 11.7.7 Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 275 pounds per cubic foot acting against the appropriate vertical native footing faces. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance. An increase of one-third is permitted when using the alternate load combination in Section 1605.3.2 of the 2019 CBC that includes wind or earthquake loads.
- 11.7.8 Underground utilities running parallel to footings should not be constructed in the zone of influence of footings. The zone of influence may be taken to be the area beneath the footing and within a 1:1 plane extending out and down from the bottom edge of the footing.
- 11.7.9 The foundation subgrade should be sprinkled as necessary to maintain a moist condition without significant shrinkage cracks as would be expected in any concrete placement. Prior to placing rebar reinforcement, foundation excavations should be evaluated by a representative of SALEM for appropriate support characteristics and moisture content. Moisture conditioning may be required for the materials exposed at footing bottom, particularly if foundation excavations are left open for an extended period.

11.8 Interior Concrete Slabs-on-Grade

- 11.8.1 Slab thickness and reinforcement should be determined by the structural engineer based on the anticipated loading. We recommend that non-structural slabs-on-grade be at least 6 inches thick and underlain by four (4) inches of class 2 aggregate base compacted to 95 percent relative compaction over engineered fill extending below foundations.
- 11.8.2 We recommend reinforcing slabs, at a minimum, welded wire or fiber mesh reinforcement. The type of reinforcement should be selected by the structural engineer.
- 11.8.3 The spacing of crack control joints should be designed by the project structural engineer. In order to regulate cracking of the slabs, we recommend that full depth construction joints or control joints be provided at a maximum spacing of 15 feet in each direction for 5-inch thick slabs.
- 11.8.4 Crack control joints should extend a minimum depth of one-fourth the slab thickness and should be constructed using saw-cuts or other methods as soon as practical after concrete placement. The exterior floors should be poured separately in order to act independently of the walls and foundation system.

- 11.8.5 It is recommended that the utility trenches within the structure be compacted, as specified in our report, to minimize the transmission of moisture through the utility trench backfill. Special attention to the immediate drainage and irrigation around the structures is recommended.
- 11.8.6 Moisture within the structure may be derived from water vapors, which were transformed from the moisture within the soils. This moisture vapor penetration can affect floor coverings and produce mold and mildew in the structure. To minimize moisture vapor intrusion, it is recommended that a vapor retarder be installed in accordance with manufacturer's recommendations and/or ASTM guidelines, whichever is more stringent. In addition, ventilation of the structure is recommended to reduce the accumulation of interior moisture.
- 11.8.7 In areas where it is desired to reduce floor dampness where moisture-sensitive coverings, coatings, underlayments, adhesives, moisture sensitive goods, humidity controlled environments, or climate cooled environments are anticipated, construction should have a suitable waterproof vapor retarder (a minimum of 15 mils thick, is recommended, polyethylene vapor retarder sheeting, Raven Industries "VaporBlock 15, Stego Industries 15 mil "StegoWrap" or W.R. Meadows Sealtight 15 mil "Perminator") incorporated into the floor slab design. The water vapor retarder should be a decay resistant material complying with ASTM E96 or ASTM E1249 not exceeding 0.01 perms, ASTM E154 and ASTM E1745 Class A. The vapor retarder should, maintain the recommended permeance **after** conditioning tests per ASTM E1745. The vapor barrier should be placed between the concrete slab and the compacted granular aggregate subbase material. The water vapor retarder (vapor barrier) should be installed in accordance with ASTM Specification E 1643-18.
- 11.8.8 The concrete maybe placed directly on vapor retarder. The vapor retarder should be inspected prior to concrete placement. Cut or punctured retarder should be repaired using vapor retarder material lapped 6 inches beyond damaged areas and taped. Extend vapor retarder over footings and seal to foundation wall or slab at an elevation consistent with the top of the slab or terminate at impediments such as water stops or dowels. Seal around penetrations such as utilities or columns in order to create a monolithic membrane between the surface of the slab and moisture sources below the slab as well as at the slab perimeter.
- 11.8.9 Avoid use of stakes driven through the vapor retarder.
- 11.8.10 The recommendations of this report are intended to reduce the potential for cracking of slabs due to soil movement. However, even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade may exhibit some cracking due to soil movement. This is common for project areas that contain expansive soils since designing to eliminate potential soil movement is cost prohibitive. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.
- 11.8.11 Proper finishing and curing should be performed in accordance with the latest guidelines provided by the American Concrete Institute, Portland Cement Association, and ASTM.

11.9 Exterior Concrete Slabs on Grade

- 11.9.1 The following recommendations are intended for lightly loaded exterior slabs on grade not subject to vehicular traffic. Slab thickness and reinforcement should be determined by the structural engineer based on the anticipated loading. We recommend that non-structural slabs-on-grade be at least 4 inches thick and underlain by four (4) inches of class 2 aggregate base over subgrade soils prepared in accordance with the recommendations in section 11.3 of this report. As an alternative, if the School District is willing to accept additional risk for distress to exterior slabs, slabs on grade located outside the building pad may be supported directly over compacted subgrade soils as recommended above.
- 11.9.2 The spacing of crack control joints should be designed by the project structural engineer. In order to regulate cracking of the slabs, we recommend that full depth construction joints or control joints be provided at a maximum spacing of 15 feet in each direction for 5-inch thick slabs and 12 feet for 4-inch thick slabs.
- 11.9.3 Crack control joints should extend a minimum depth of one-fourth the slab thickness and should be constructed using saw-cuts or other methods as soon as practical after concrete placement.
- 11.9.4 Proper finishing and curing should be performed in accordance with the latest guidelines provided by the American Concrete Institute, Portland Cement Association, and ASTM.

11.10 Lateral Earth Pressures and Frictional Resistance

- 11.10.1 Active, at-rest and passive unit lateral earth pressures against footings and walls are summarized in the table below:

Lateral Pressure Conditions	Soil Equivalent Fluid Pressure
Active Pressure, Drained, pcf	37
At-Rest Pressure, Drained, pcf	57
Allowable Passive Pressure, psf	275
Allowable Coefficient of Friction	0.31
Minimum Wet Unit Weight (lbs/ft ³)	95
Maximum Wet Unit Weight (lbs/ft ³)	125

- 11.10.2 Active pressure applies to walls, which are free to rotate. At-rest pressure applies to walls, which are restrained against rotation. The preceding lateral earth pressures assume sufficient drainage behind retaining walls to prevent the build-up of hydrostatic pressure. The top one-foot of adjacent subgrade should be deleted from the passive pressure computation.
- 11.10.3 The allowable parameters include a safety factor of 1.5 and can be used in design for direct comparison of resisting loads against lateral driving loads.

- 11.10.4 If combined passive and frictional resistance is used in design, a 50 percent reduction in frictional resistance is recommended.
- 11.10.5 For lateral stability against seismic loading conditions, we recommend a minimum safety factor of 1.1.
- 11.10.6 For dynamic seismic lateral loading the following equation shall be used:

Dynamic Seismic Lateral Loading Equation
Dynamic Seismic Lateral Load = $\frac{3}{8}\gamma K_h H^2$
Where: γ = Maximum In-Place Soil Density (Section 11.10.1 above)
K_h = Horizontal Acceleration = $\frac{2}{3}PG_{AM}$ (Section 11.6.1 above)
H = Wall Height

11.11 Retaining Walls

- 11.11.1 Retaining and/or below grade walls should be drained with either perforated pipe encased in free-draining gravel or a prefabricated drainage system. The gravel zone should have a minimum width of 12 inches wide and should extend upward to within 12 inches of the top of the wall. The upper 12 inches of backfill should consist of native soils, concrete, asphaltic-concrete or other suitable backfill to minimize surface drainage into the wall drain system. The gravel should conform to Class 2 permeable materials graded in accordance with the current Caltrans Standard Specifications.
- 11.11.2 Prefabricated drainage systems, such as Miradrain®, Enkadrain®, or an equivalent substitute, are acceptable alternatives in lieu of gravel provided they are installed in accordance with the manufacturer's recommendations. If a prefabricated drainage system is proposed, our firm should review the system for final acceptance prior to installation.
- 11.11.3 Drainage pipes should be placed with perforations down and should discharge in a non-erosive manner away from foundations and other improvements.
- 11.11.4 The top of the perforated pipe should be placed at or below the bottom of the adjacent floor slab or pavements. The pipe should be placed in the center line of the drainage blanket and should have a minimum diameter of 4 inches. Slots should be no wider than 1/8-inch in diameter, while perforations should be no more than 1/4-inch in diameter.
- 11.11.5 If retaining walls are less than 5 feet in height, the perforated pipe may be omitted in lieu of weep holes on 4 feet maximum spacing. The weep holes should consist of 2-inch minimum diameter holes (concrete walls) or unmortared head joints (masonry walls) and placed no higher than 18 inches above the lowest adjacent grade. Two 8-inch square overlapping patches of geotextile fabric (conforming to the Caltrans Standard Specifications for "edge drains") should be affixed to the rear wall opening of each weep hole to retard soil piping.
- 11.11.6 During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall, or within a lateral distance equal

to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

11.12 Temporary Excavations

- 11.12.1 We anticipate that the majority of the dense site soils will be classified as Cal-OSHA "Type C" soil when encountered in excavations during site development and construction. Excavation sloping, benching, the use of trench shields, and the placement of trench spoils should conform to the latest applicable Cal-OSHA standards. The contractor should have a Cal-OSHA-approved "competent person" onsite during excavation to evaluate trench conditions and make appropriate recommendations where necessary.
- 11.12.2 It is the contractor's responsibility to provide sufficient and safe excavation support as well as protecting nearby utilities, structures, and other improvements which may be damaged by earth movements. All onsite excavations must be conducted in such a manner that potential surcharges from existing structures, construction equipment, and vehicle loads are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing foundation or vehicle load.
- 11.12.3 Temporary excavations and slope faces should be protected from rainfall and erosion. Surface runoff should be directed away from excavations and slopes.
- 11.12.4 Open, unbraced excavations in undisturbed soils should be made according to the slopes presented in the following table:

RECOMMENDED EXCAVATION SLOPES

Depth of Excavation (ft)	Slope (Horizontal : Vertical)
0-5	1:1
5-10	1½:1
10-15	2:1

- 11.12.5 If, due to space limitation, excavations near existing structures are performed in a vertical position, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavations and installation. A Specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction.
- 11.12.6 Braced shorings should be designed for a maximum pressure distribution of 40H, (where H is the depth of the excavation in feet). The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given herein. Equipment traffic should concurrently be limited to an area at least 3 feet from the shoring face or edge of the slope.

- 11.12.7 The excavation and shoring recommendations provided herein are based on soil characteristics derived from the borings within the area. Variations in soil conditions will likely be encountered during the excavations. SALEM Engineering Group, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation. Slope height, slope inclination, or excavation depth should in no case exceed those specified in local, state, or federal safety regulation, (e.g. OSHA) standards for excavations, 29 CFR part 1926, or Assessor's regulations.

11.13 Underground Utilities

- 11.13.1 Underground utility trenches should be backfilled with properly compacted material. The material excavated from the trenches should be adequate for use as backfill provided it does not contain deleterious matter, vegetation or rock larger than 3 inches in maximum dimension. Trench backfill should be placed in loose lifts not exceeding 8 inches and compacted to at least 92 percent relative compaction at or above optimum moisture content. The upper 12 inches of trench backfill within asphalt or concrete paved areas shall be moisture conditioned to at or above optimum moisture content and compacted to at least 95 percent relative compaction.
- 11.13.2 Bedding and pipe zone backfill typically extends from the bottom of the trench excavations to approximately 12 inches above the crown of the pipe. Pipe bedding, haunches and initial fill extending to 1 foot above the pipe should consist of a clean well graded sand with 100 percent passing the #4 sieve, a maximum of 15 percent passing the #200 sieve, and a minimum sand equivalent of 20.
- 11.13.3 It is suggested that underground utilities crossing beneath new or existing structures be plugged at entry and exit locations to the building or structure to prevent water migration. Trench plugs can consist of on-site clay soils, if available, or sand cement slurry. The trench plugs should extend 2 feet beyond each side of individual perimeter foundations.
- 11.13.4 The contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

12. PLAN REVIEW, CONSTRUCTION OBSERVATION AND TESTING

12.1 Plan and Specification Review

- 12.1.1 SALEM should review the project plans and specifications prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required.

12.2 Construction Observation and Testing Services

- 12.2.1 The recommendations provided in this report are based on the assumption that we will continue as Geotechnical Engineer of Record throughout the construction phase. It is important to maintain continuity of geotechnical interpretation and confirm that field conditions encountered are similar to those anticipated during design. If we are not retained for these services, we cannot assume any

responsibility for others interpretation of our recommendations, and therefore the future performance of the project.

- 12.2.2 SALEM should be present at the site during site preparation to observe site clearing, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.
- 12.2.3 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

13. LIMITATIONS AND CHANGED CONDITIONS

The analyses and recommendations submitted in this report are based upon the data obtained from the test borings drilled at the approximate locations shown on the Site Plan, Figure 2. The report does not reflect variations which may occur between borings. The nature and extent of such variations may not become evident until construction is initiated.

If variations then appear, a re-evaluation of the recommendations of this report will be necessary after performing on-site observations during the excavation period and noting the characteristics of such variations. The findings and recommendations presented in this report are valid as of the present and for the proposed construction.

If site conditions change due to natural processes or human intervention on the property or adjacent to the site, or changes occur in the nature or design of the project, or if there is a substantial time lapse between the submission of this report and the start of the work at the site, the conclusions and recommendations contained in our report will not be considered valid unless the changes are reviewed by SALEM and the conclusions of our report are modified or verified in writing. The validity of the recommendations contained in this report is also dependent upon an adequate testing and observations program during the construction phase. Our firm assumes no responsibility for construction compliance with the design concepts or recommendations unless we have been retained to perform the on-site testing and review during construction. SALEM has prepared this report for the exclusive use of the owner and project design consultants

SALEM does not practice in the field of corrosion engineering. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, that manufacturer's recommendations for corrosion protection be closely followed. Further, a corrosion engineer may be needed to incorporate the necessary precautions to avoid premature corrosion of concrete slabs and foundations in direct contact with native soil. The importation of soil and or aggregate materials to the site should be screened to determine the potential for corrosion to concrete and buried metal piping. The report has been prepared in accordance with generally accepted geotechnical engineering practices in the area. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (559) 271-9700.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.



Ahmad Dalqamouni, Ph.D., M.CE
Geotechnical Project Engineer
Central / Northern California



Dean B. Ledgerwood II, CEG
Northern California Geotechnical Manager
CEG 2613

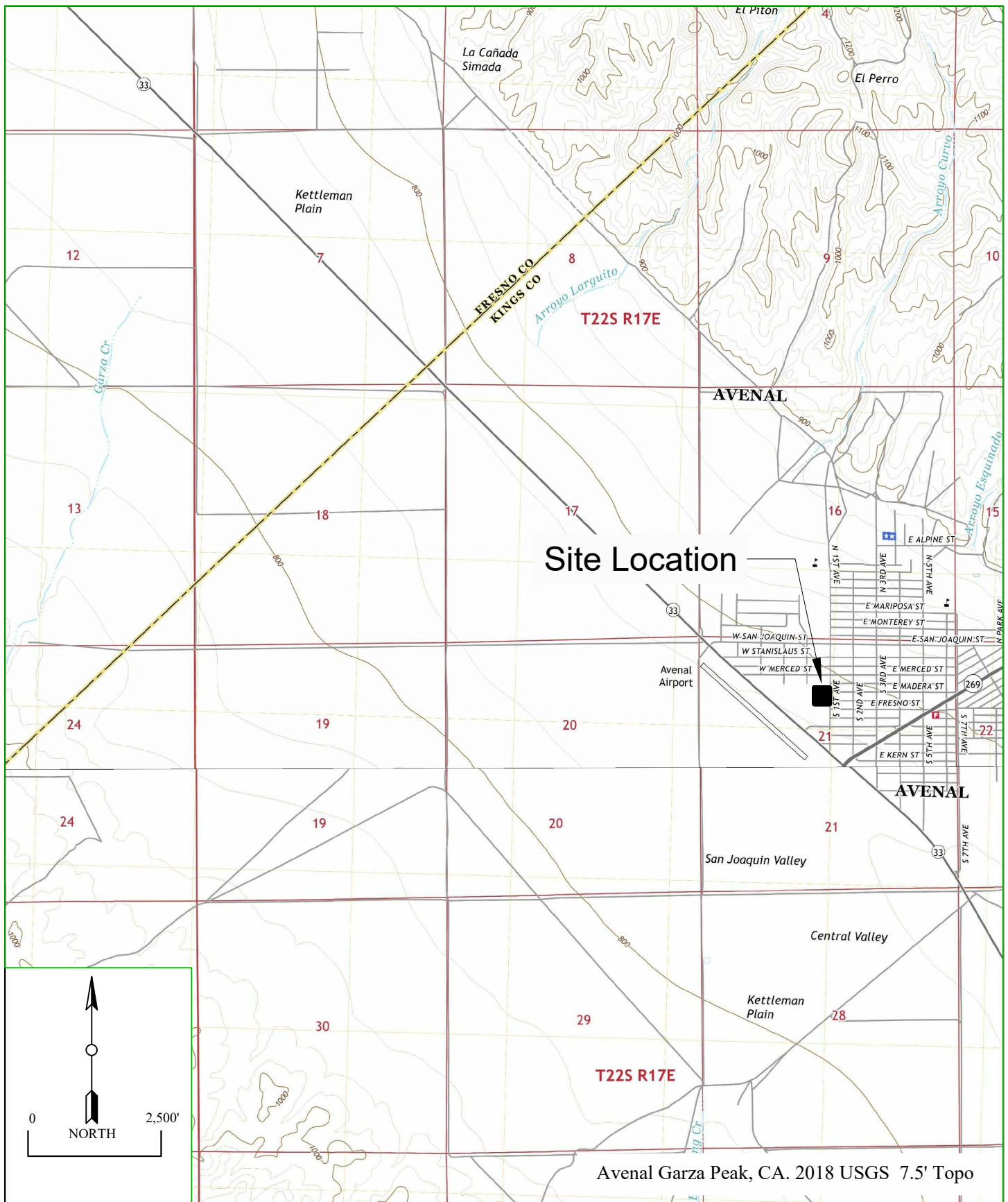



R. Sammy Salem, MS, PE, GE
Principal Managing Engineer
RCE 52762 / RGE 2549

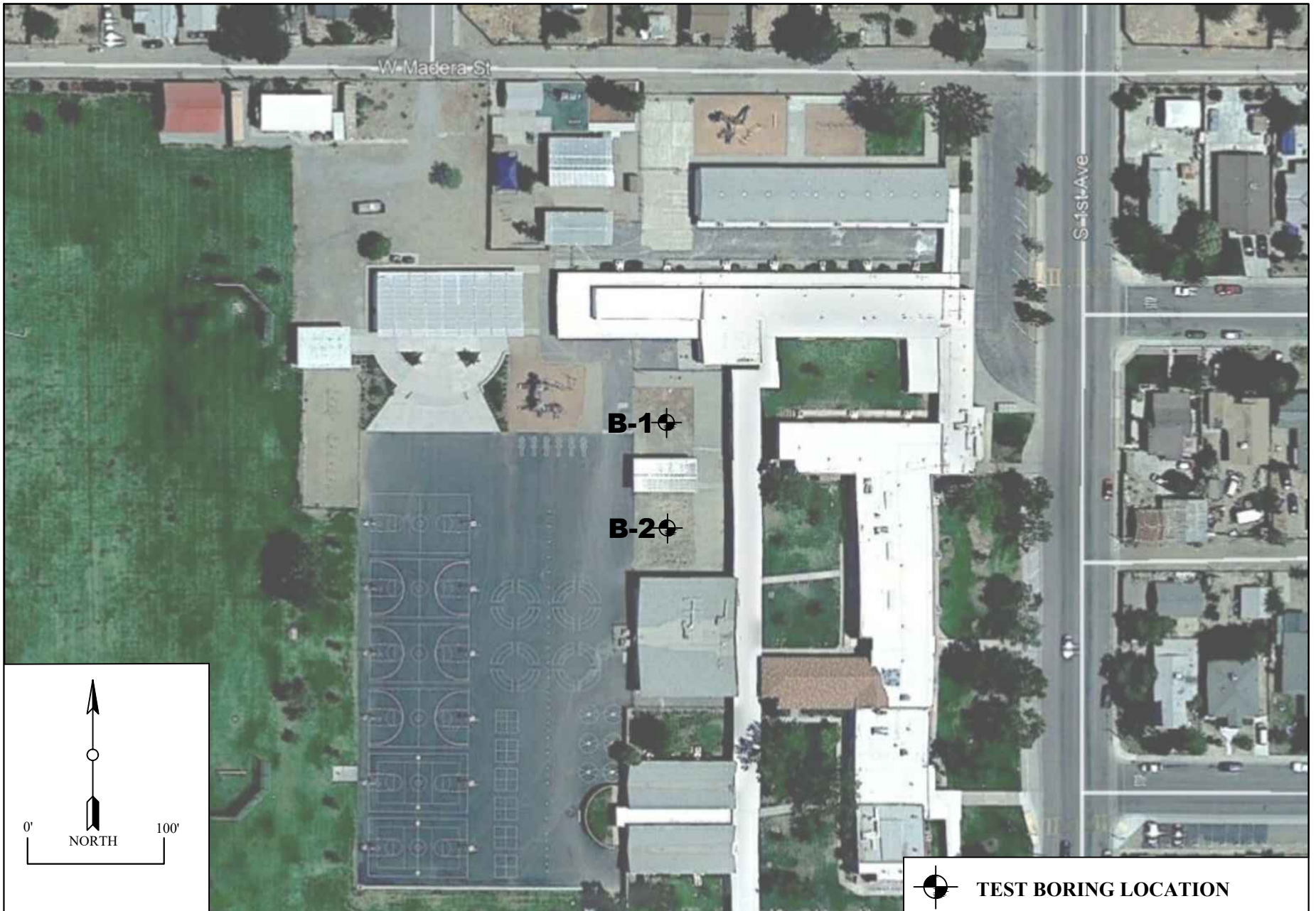


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- United States Geological Survey, Circular Area Earthquake Search" ([http:// earthquake.usgs.gov/earthquakes/eqarchives/epic/epic_circ.php](http://earthquake.usgs.gov/earthquakes/eqarchives/epic/epic_circ.php))



VICINITY MAP	SCALE: 1 : 2500'	DATE: JULY 2020	
PROPOSED CLASSROOM BUILDING AVENAL ELEMENTARY SCHOOL AVENAL, CALIFORNIA	DRAWN BY: VT	APPROVED BY: DL	
	PROJECT NO. 1-220-0546	FIGURE NO. 1	



 TEST BORING LOCATION

SITE PLAN

PROPOSED CLASSROOM BUILDING
AVENAL ELEMENTARY SCHOOL
500 S. 1ST AVENUE
AVENAL, CALIFORNIA

SCALE: 1"=100'

DATE: JULY 2020

DRAWN BY: VT

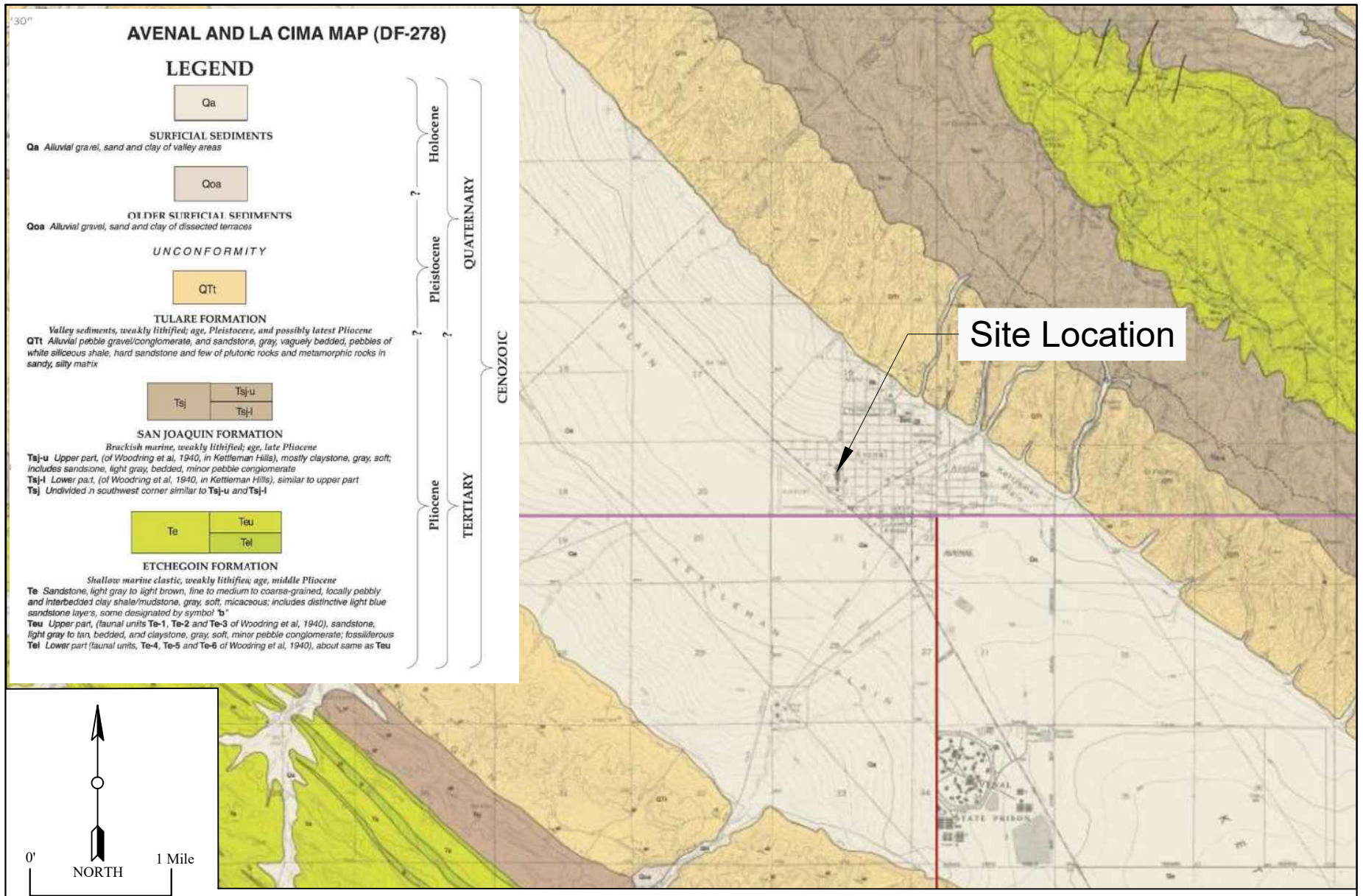
APPROVED BY: DL

PROJECT NO. 1-220-0546

FIGURE NO. 2



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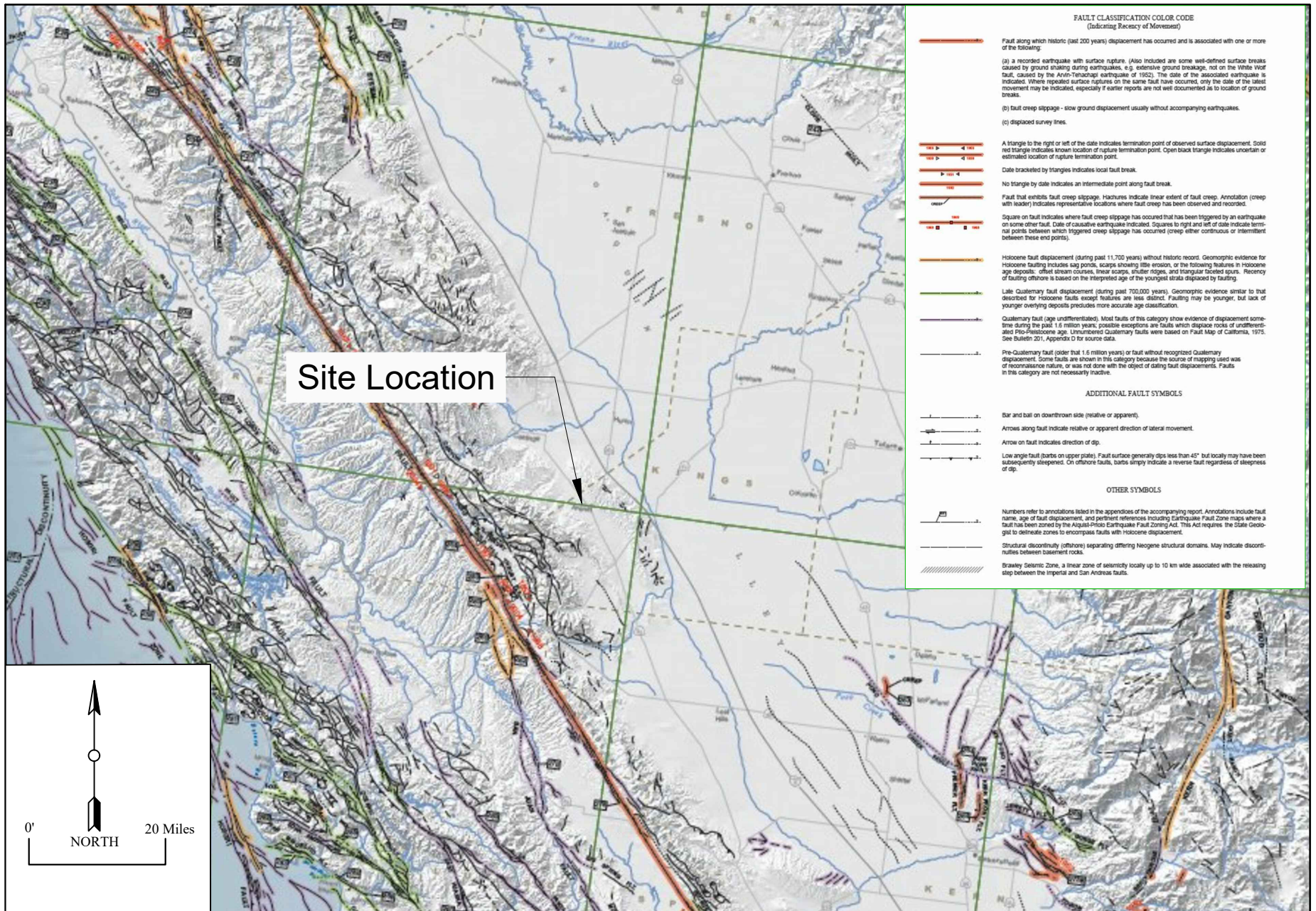


Dibblee, T.W., and Minch, J.A., 2006, Geologic map of the Avenal and La Cima quadrangles, Fresno and Kings Counties, California

REGIONAL GEOLOGIC MAP	SCALE: 1" = 1 Mile	DATE: JULY 2020
PROPOSED CLASSROOM BUILDING AVENAL ELEMENTARY SCHOOL 500 S. 1ST AVENUE AVENAL, CALIFORNIA	DRAWN BY: VT	APPROVED BY: DL
	PROJECT NO. 1-220-0546	FIGURE NO. 3



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FAULT LOCATION MAP

PROPOSED CLASSROOM BUILDING
AVENAL ELEMENTARY SCHOOL
500 S. 1ST AVENUE
AVENAL, CALIFORNIA

SCALE: 1"=20 Miles

DATE: JULY 2020

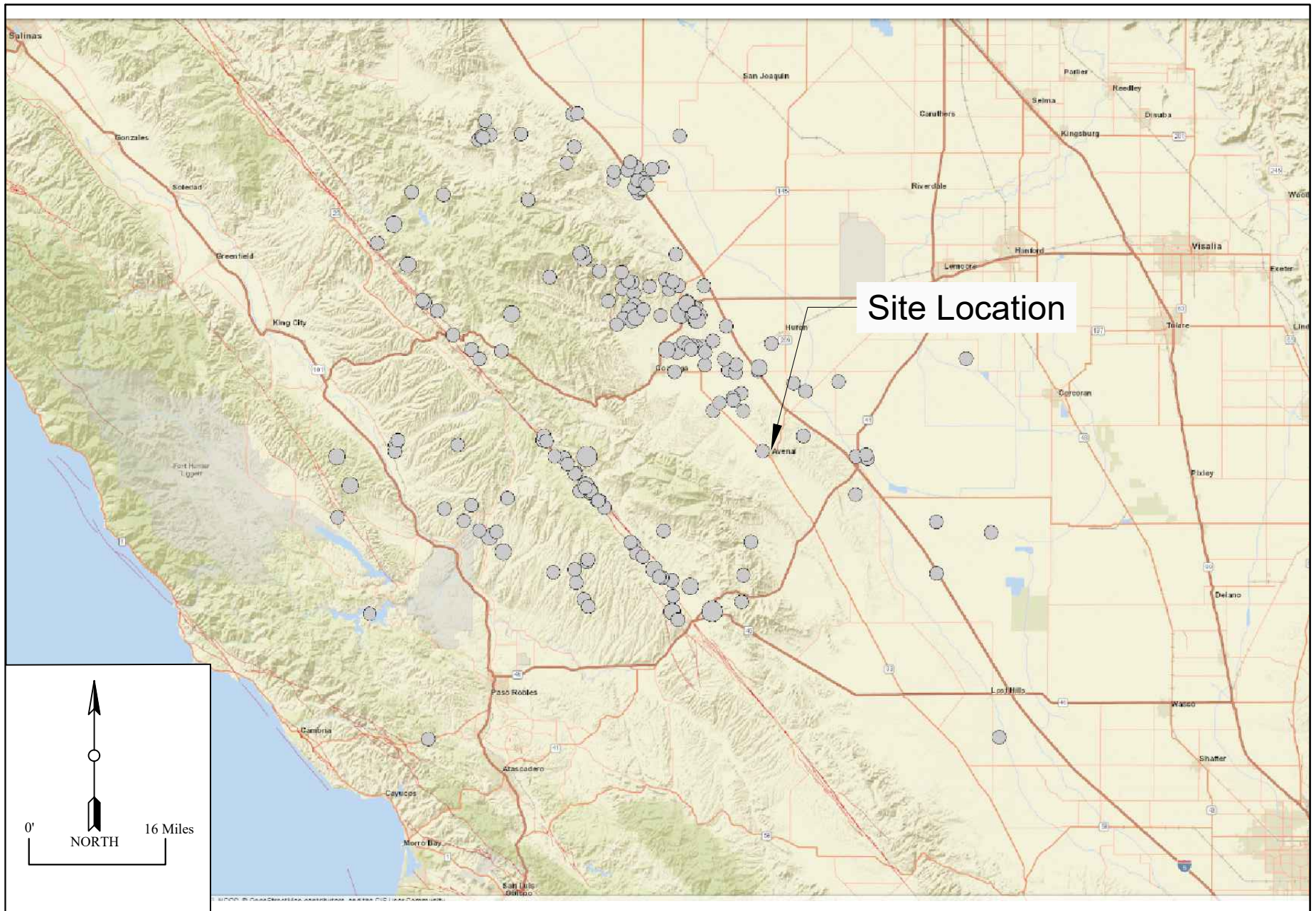
DRAWN BY: VT

APPROVED BY: DL

PROJECT NO. 1-220-0546

FIGURE NO. 4





**EARTHQUAKE EPICENTER
LOCATION MAP**

PROPOSED CLASSROOM BUILDING
AVENAL ELEMENTARY SCHOOL
500 S. 1ST AVENUE
AVENAL, CALIFORNIA

SCALE: 1" = 16 Miles

DATE: JULY 2020

DRAWN BY: VT

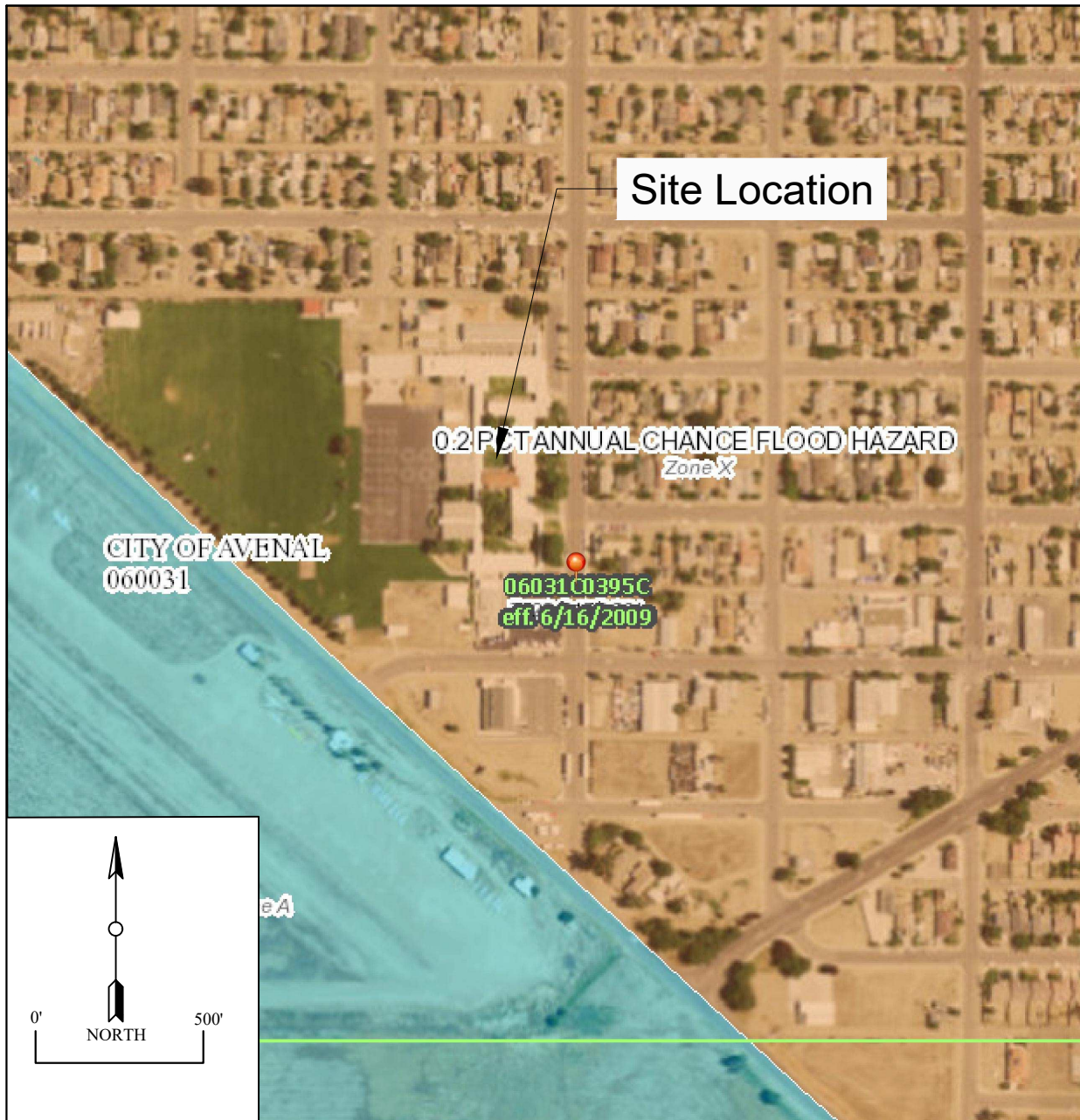
APPROVED BY: DL

PROJECT NO. 1-220-0546

FIGURE NO. 5



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Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone L</i>
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
	MAP PANELS	
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

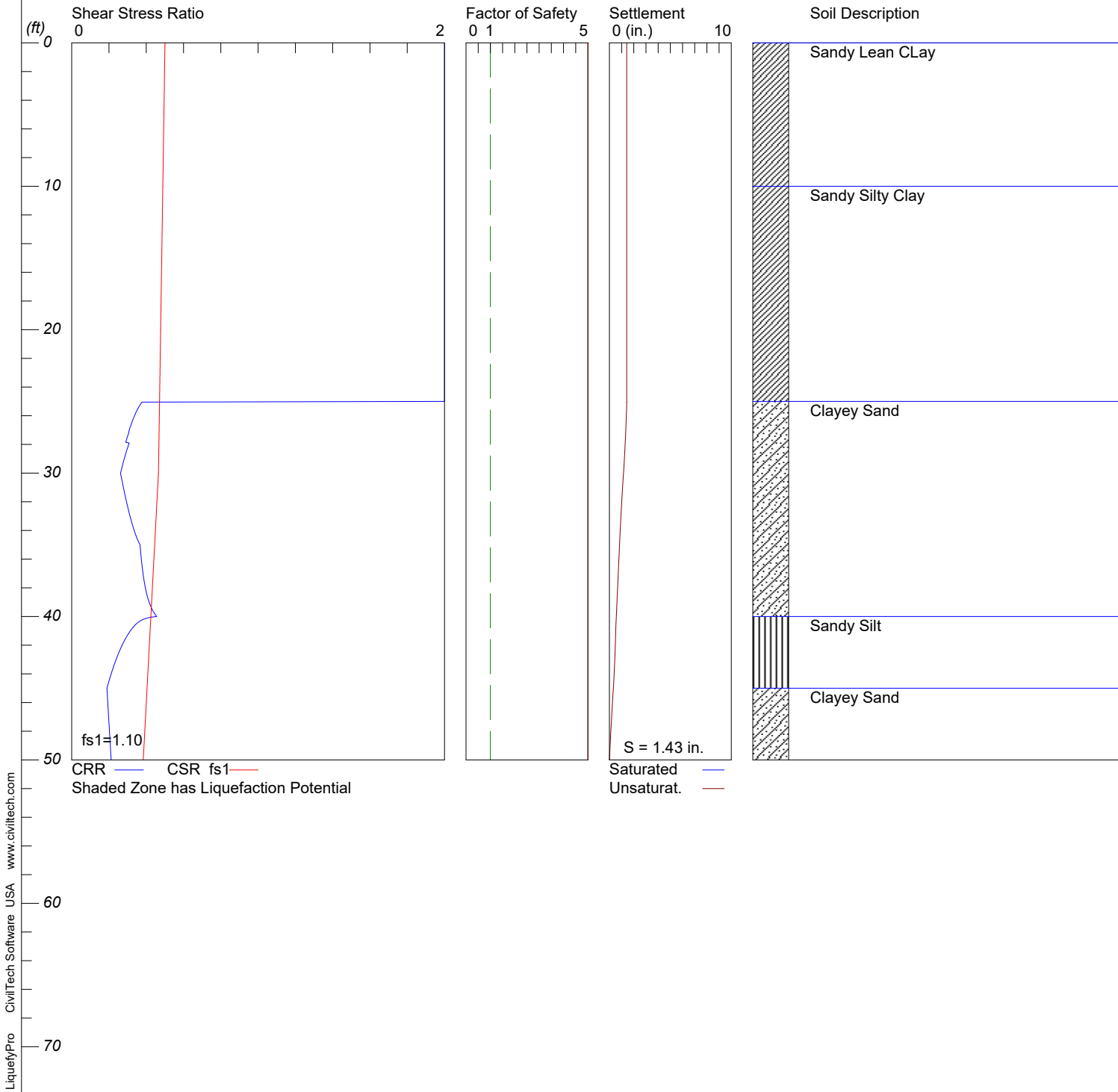
FLOOD ZONE MAP	SCALE: 1"= 500'	DATE: JULY 2020	
PROPOSED CLASSROOM BUILDING AVENAL ELEMENTARY SCHOOL 500 S. 1ST AVENUE AVENAL, CALIFORNIA	DRAWN BY: VT	APPROVED BY: DL	
	PROJECT NO. 1-220-0546	FIGURE NO. 6	

LIQUEFACTION ANALYSIS

Proposed Classroom Building - Avenal

Hole No.=B-1 Water Depth=200 ft

Magnitude=7.5
Acceleration=0.7g



LIQUEFACTION ANALYSIS SUMMARY

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www.civiltech.com

Title: Proposed Classroom Building - Avenal

Subtitle: 1-220-0546

Hole No.=B-1

Depth of Hole= 50.00 ft

Water Table during Earthquake= 200.00 ft

Water Table during In-Situ Testing= 200.00 ft

Max. Acceleration= 0.7 g

Earthquake Magnitude= 7.50

Input Data:

Hole No.=B-1

Depth of Hole=50.00 ft

Water Table during Earthquake= 200.00 ft

Water Table during In-Situ Testing= 200.00 ft

Max. Acceleration=0.7 g

Earthquake Magnitude=7.50

No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, $C_e = 1.25$
7. Borehole Diameter, $C_b = 1.05$
8. Sampling Method, $C_s = 1.2$
9. User request factor of safety (apply to CSR) , $U_{sr} = 1.1$
Plot one CSR curve ($f_{s1} = U_{sr}$)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
-------------	-----	--------------	------------

0.00	8.00	120.00	NoLiq
5.00	9.00	120.00	NoLiq
10.00	5.00	120.00	NoLiq
15.00	18.00	120.00	NoLiq
20.00	15.00	120.00	NoLiq
25.00	16.00	120.00	40.00
30.00	13.00	120.00	40.00
35.00	18.00	120.00	40.00
40.00	20.00	120.00	80.00
45.00	12.00	120.00	40.00
50.00	15.00	120.00	40.00

Output Results:

Settlement of Saturated Sands=0.00 in.

Settlement of Unsaturated Sands=1.43 in.

Total Settlement of Saturated and Unsaturated Sands=1.43 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.50	5.00	0.00	1.43	1.43
1.00	2.00	0.50	5.00	0.00	1.43	1.43
2.00	2.00	0.50	5.00	0.00	1.43	1.43
3.00	2.00	0.50	5.00	0.00	1.43	1.43
4.00	2.00	0.50	5.00	0.00	1.43	1.43
5.00	2.00	0.49	5.00	0.00	1.43	1.43
6.00	2.00	0.49	5.00	0.00	1.43	1.43
7.00	2.00	0.49	5.00	0.00	1.43	1.43
8.00	2.00	0.49	5.00	0.00	1.43	1.43
9.00	2.00	0.49	5.00	0.00	1.43	1.43
10.00	2.00	0.49	5.00	0.00	1.43	1.43
11.00	2.00	0.49	5.00	0.00	1.43	1.43
12.00	2.00	0.49	5.00	0.00	1.43	1.43
13.00	2.00	0.49	5.00	0.00	1.43	1.43
14.00	2.00	0.48	5.00	0.00	1.43	1.43
15.00	2.00	0.48	5.00	0.00	1.43	1.43
16.00	2.00	0.48	5.00	0.00	1.43	1.43
17.00	2.00	0.48	5.00	0.00	1.43	1.43
18.00	2.00	0.48	5.00	0.00	1.43	1.43
19.00	2.00	0.48	5.00	0.00	1.43	1.43
20.00	2.00	0.48	5.00	0.00	1.43	1.43
21.00	2.00	0.48	5.00	0.00	1.43	1.43
22.00	2.00	0.47	5.00	0.00	1.43	1.43
23.00	2.00	0.47	5.00	0.00	1.43	1.43
24.00	2.00	0.47	5.00	0.00	1.43	1.43
25.00	2.00	0.47	5.00	0.00	1.43	1.43
26.00	0.34	0.47	5.00	0.00	1.39	1.39
27.00	0.31	0.47	5.00	0.00	1.34	1.34
28.00	0.31	0.47	5.00	0.00	1.29	1.29
29.00	0.28	0.47	5.00	0.00	1.23	1.23
30.00	0.26	0.47	5.00	0.00	1.16	1.16
31.00	0.28	0.46	5.00	0.00	1.08	1.08
32.00	0.29	0.46	5.00	0.00	1.01	1.01
33.00	0.31	0.45	5.00	0.00	0.95	0.95
34.00	0.34	0.45	5.00	0.00	0.89	0.89
35.00	0.37	0.45	5.00	0.00	0.83	0.83
36.00	0.37	0.44	5.00	0.00	0.78	0.78
37.00	0.38	0.44	5.00	0.00	0.73	0.73
38.00	0.40	0.43	5.00	0.00	0.67	0.67
39.00	0.42	0.43	5.00	0.00	0.62	0.62
40.00	0.46	0.42	5.00	0.00	0.57	0.57
41.00	0.31	0.42	5.00	0.00	0.52	0.52
42.00	0.27	0.42	5.00	0.00	0.48	0.48
43.00	0.24	0.41	5.00	0.00	0.44	0.44
44.00	0.21	0.41	5.00	0.00	0.39	0.39
45.00	0.19	0.40	5.00	0.00	0.32	0.32
46.00	0.19	0.40	5.00	0.00	0.25	0.25
47.00	0.20	0.40	5.00	0.00	0.18	0.18
48.00	0.20	0.39	5.00	0.00	0.12	0.12
49.00	0.21	0.39	5.00	0.00	0.06	0.06
50.00	0.21	0.38	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone

(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft²)

CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils



APPENDIX A FIELD EXPLORATION

Fieldwork for our investigation (drilling) was conducted on July 23, 2020 and included a site visit, subsurface exploration, and soil sampling. The locations of the exploratory borings are shown on the Site Plan, Figure 2. Boring logs for our exploration are presented in figures following the text in this appendix. Borings were located in the field using existing reference points. Therefore, actual boring locations may deviate slightly.

In general, our borings were performed using a truck-mounted CME-45C drill rig equipped with 6-inch hollow stem auger and 4-inch diameter solid-flight. Sampling in the borings was accomplished using a hydraulic 140-pound hammer with a 30-inch drop. Samples were obtained with a 3-inch outside-diameter (OD), split spoon (California Modified) sampler, and a 2-inch OD, Standard Penetration Test (SPT) sampler. The number of blows required to drive the sampler the last 12 inches (or fraction thereof) of the 18-inch sampling interval were recorded on the boring logs. The blow counts shown on the boring logs should not be interpreted as standard SPT “N” values; corrections have not been applied. Upon completion, the borings were backfilled with drill cuttings.

Subsurface conditions encountered in the exploratory borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D2488). This system uses the Unified Soil Classification System (USCS) for soil designations. The logs depict soil and geologic conditions encountered and depths at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, drill rig penetration rates, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the field logs were revised based on subsequent laboratory testing.



SALEM
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Test Boring: B-1

Page 1 Of: 2

Project Number: 1-220-0546

Date: 07/23/2020

Client: Alan Mok Engineering

Project: Proposed Classroom Building - Avenal Elementary School

Location: 500 S. 1st Avenue, Avenal, CA.

Drilled By: Salem Engineering Group, Inc. **Logged By:** AG

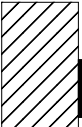




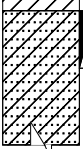
Drill Type: CME 55

Elevation: 790ft. AMSL

Auger Type: 6in. Solid Flight Auger

Initial Depth to Groundwater: N/E

Hammer Type: Automatic Trip - 140lbs./30in. **Final Depth to Groundwater:** N/E

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
790 0		CL	Sandy Lean CLAY; stiff, brown, moist, with some clay trace of gravel.	11	12.8	97.2	
785 5			Grades as above.	12	15.8	99.0	
780 10			Sandy Silty CLAY; soft, brown, moist, trace gravel.	5	16.7	--	
775 15			Sandy Silty CLAY; very stiff, brown, moist.	18	14.9	--	
770 20			Sandy Silty CLAY; stiff, brown, moist, low plasticity.	15	18.3	--	
765 25		SC	Clayey SAND; medium dense, brown, moist, medium to fine grained.	16	13.0	--	

Notes:

Figure Number A-1



SALEM
engineering group, inc.

Project Number: 1-220-0546

Date: 07/23/2020

Test Boring: B-1

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
760 30			Grades as above.	13	8.5	--	
755 35			Grades as above.	18	9.5	--	
750 40		ML	Sandy SILT; very stiff, brown, moist, with clay.	20	14.3	--	
745 45		SC	Clayey SAND; medium dense, brown, moist, with clay.	12	10.6	--	
740 50			Grades as above.	15	15.5	--	
735 55			End of boring at 51.5ft. BSG				
730 60							

Notes:

Figure Number A-1



SALEM
engineering group, inc.

Test Boring: B-2

Page 1 Of: 1

Project Number: 1-220-0546

Date: 07/23/2020

Client: Alan Mok Engineering

Project: Proposed Classroom Building - Avenal Elementary School

Location: 500 S. 1st Avenue, Avenal, CA.

Drilled By: Salem Engineering Group, Inc. **Logged By:** AG

Drill Type: CME 55

Elevation: 790ft. AMSL

Auger Type: 6in. Solid Flight Auger

Initial Depth to Groundwater: N/E

Hammer Type: Automatic Trip - 140lbs./30in. **Final Depth to Groundwater:** N/E

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
790 0		CL	Sandy Lean CLAY; stiff, brown, moist, fine grained, with clay.				
785 5	5/6 5/6 6/6		Grades as above.	11	12.3	140.6	
780 10	4/6 5/6 6/6		Sandy Silty CLAY; stiff, brown, moist.	11	14.3	99.5	
775 15	4/6 7/6 8/6		Sandy Silty CLAY; stiff, brown, moist, fine grained, with silt.	15	12.8	--	
770 20			End of boring at 16.5ft. BSG				
765 25							

Notes:

Figure Number A-2

KEY TO SYMBOLS

Symbol Description

Strata symbols



Lean Clay



Clayey sand



Silt

Misc. Symbols



Boring continues

Soil Samplers



California sampler



Standard penetration test

Notes:

Granular Soils

Blows Per Foot (Uncorrected)

	MCS	SPT
Very loose	<5	<4
Loose	5-15	4-10
Medium dense	16-40	11-30
Dense	41-65	31-50
Very dense	>65	>50

Cohesive Soils

Blows Per Foot (Uncorrected)

	MCS	SPT
Very soft	<3	<2
Soft	3-5	2-4
Firm	6-10	5-8
Stiff	11-20	9-15
Very Stiff	21-40	16-30
Hard	>40	>30

MCS = Modified California Sampler

SPT = Standard Penetration Test Sampler

APPENDIX

B



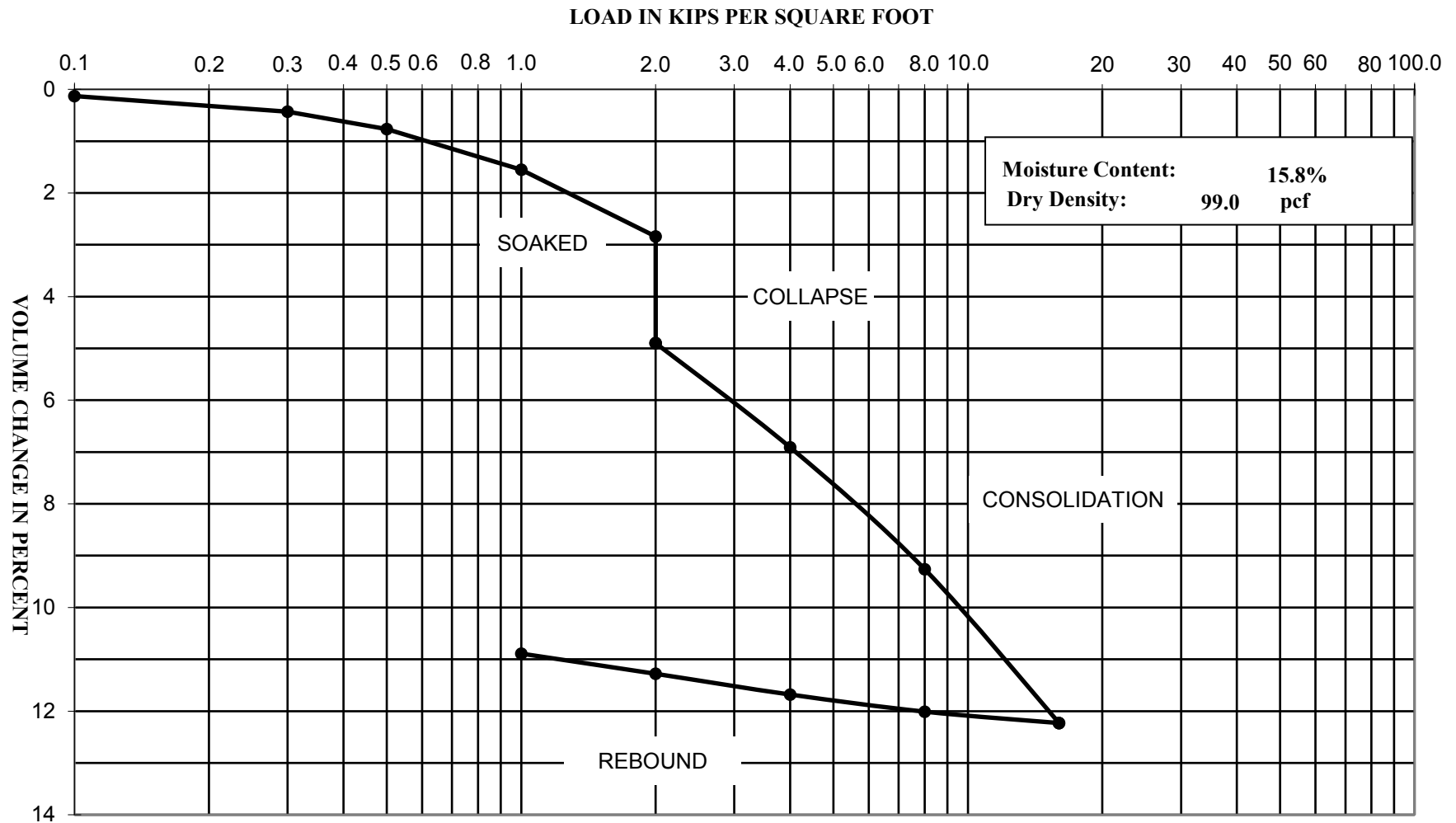
APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM), Caltrans, or other suggested procedures. Selected samples were tested for in-situ dry density and moisture content, corrosivity, consolidation, shear strength, soil resistivity, expansion index, Atterberg limit, resistance value, and grain size distribution. The results of the laboratory tests are summarized in the following figures.

CONSOLIDATION - PRESSURE TEST DATA

ASTM D2435



Project Name: Classroom Building - Avenal, CA

Project Number: 1-220-0546

Boring: B-1 @ 5'

Direct Shear Test (ASTM D3080)

Project Name: Classroom Building - Avenal, CA

Project Number: 1-220-0546

Client:

Boring: B-2 @ 3.5'

Soil Type: Sandy Lean CLAY

Sample Type: Undisturbed Ring

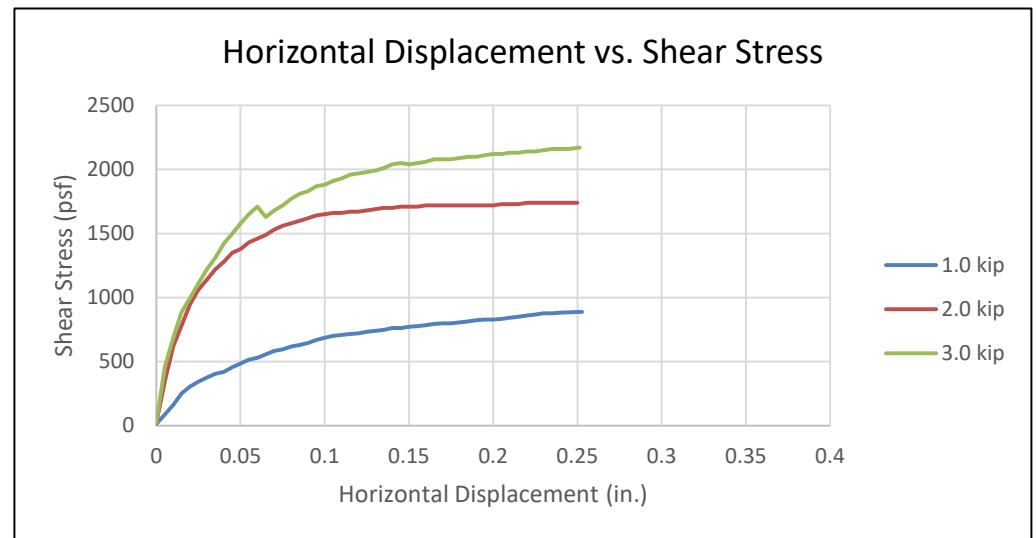
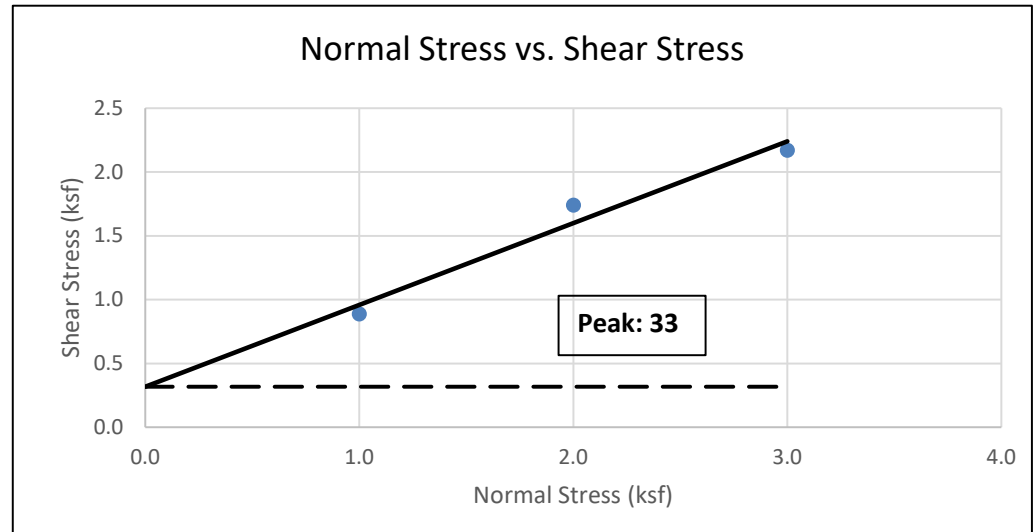
Tested By: NL

Reviewed By:

Date of Test: 7/28/20

Test Equipment: GeoComp ShearTrac II

	Loading		
	1.0 kip	2.0 kip	3.0 kip
Normal Stress (ksf)	1.00	2.00	3.00
Shear Rate (in/min)	0.0040	0.0040	0.0040
Peak Shear Stress (ksf)	0.89	1.74	2.17

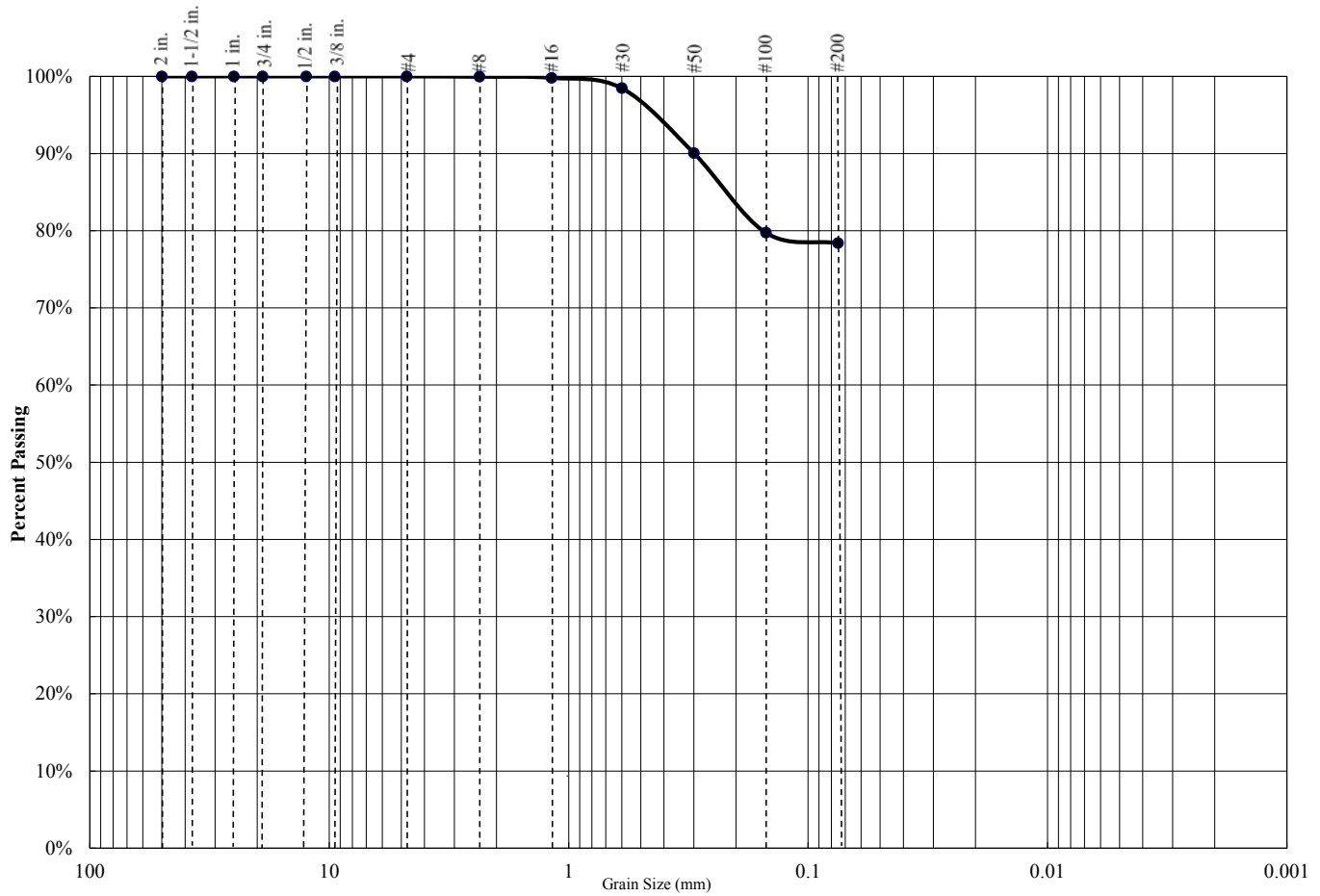


Peak Shear Strength Values	
Slope	0.64
Friction Angle	33
Cohesion (psf)	317

Initial Height of Sample (in)	1.000	1.000	1.000
Post-Consol. Sample Height (in.)	0.824	0.843	0.813
Post-Shear Sample Height (in.)	0.788	0.826	0.794
Diameter of Sample (in)	2.4	2.4	2.4
Initial (pre-shear) Values			
Moisture Content (%)	12.3		
Dry Density (pcf)	94.3	102.3	101.1
Saturation %	42.7	52.1	50.5
Void Ratio	0.77	0.63	0.65
Consolidated Void Ratio	0.46	0.37	0.34
Final (post-shear) Values			
Final Moisture Content (%)	25.8	24.2	21.7
Dry Density (pcf)	107.7	111.8	112.3
Saturation %	123.0	132.1	138.2
Void Ratio	0.56	0.49	0.42

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
0%	22%	78%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	100.0%
#4	100.0%
#8	100.0%
#16	99.8%
#30	90.1%
#50	79.7%
#100	78.4%
#200	78.4%

Atterberg Limits		
PL=	LL=	PI=

Coefficients		
D85=	D60=	D50=
D30=	D15=	D10=
C _u =	N/A	C _c = N/A

USCS CLASSIFICATION
Sandy Lean CLAY (SC)

Project Name: Classroom Building - Avenal, CA

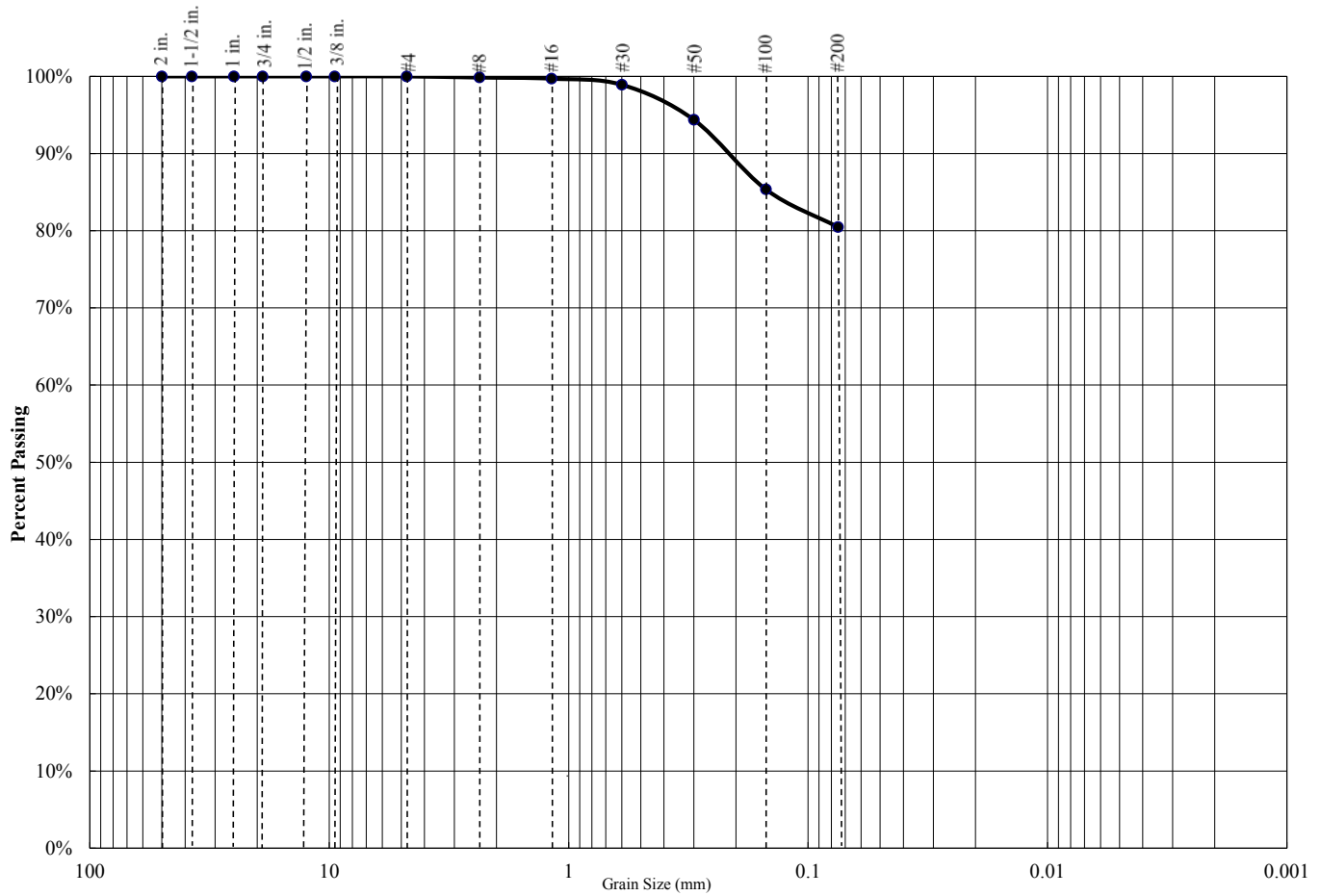
Project Number: 1-220-0546

Boring: B-1 @ 1.5'



PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
0%	20%	80%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	100.0%
#4	100.0%
#8	99.9%
#16	99.7%
#30	98.9%
#50	94.4%
#100	85.4%
#200	80.5%

Atterberg Limits		
PL=	LL=	PI=

Coefficients		
D85=	D60=	D50=
D30=	D15=	D10=
C _u =	N/A	C _c = N/A

USCS CLASSIFICATION
Sandy Silty CLAY (SC-SM)

Project Name: Classroom Building - Avenal, CA

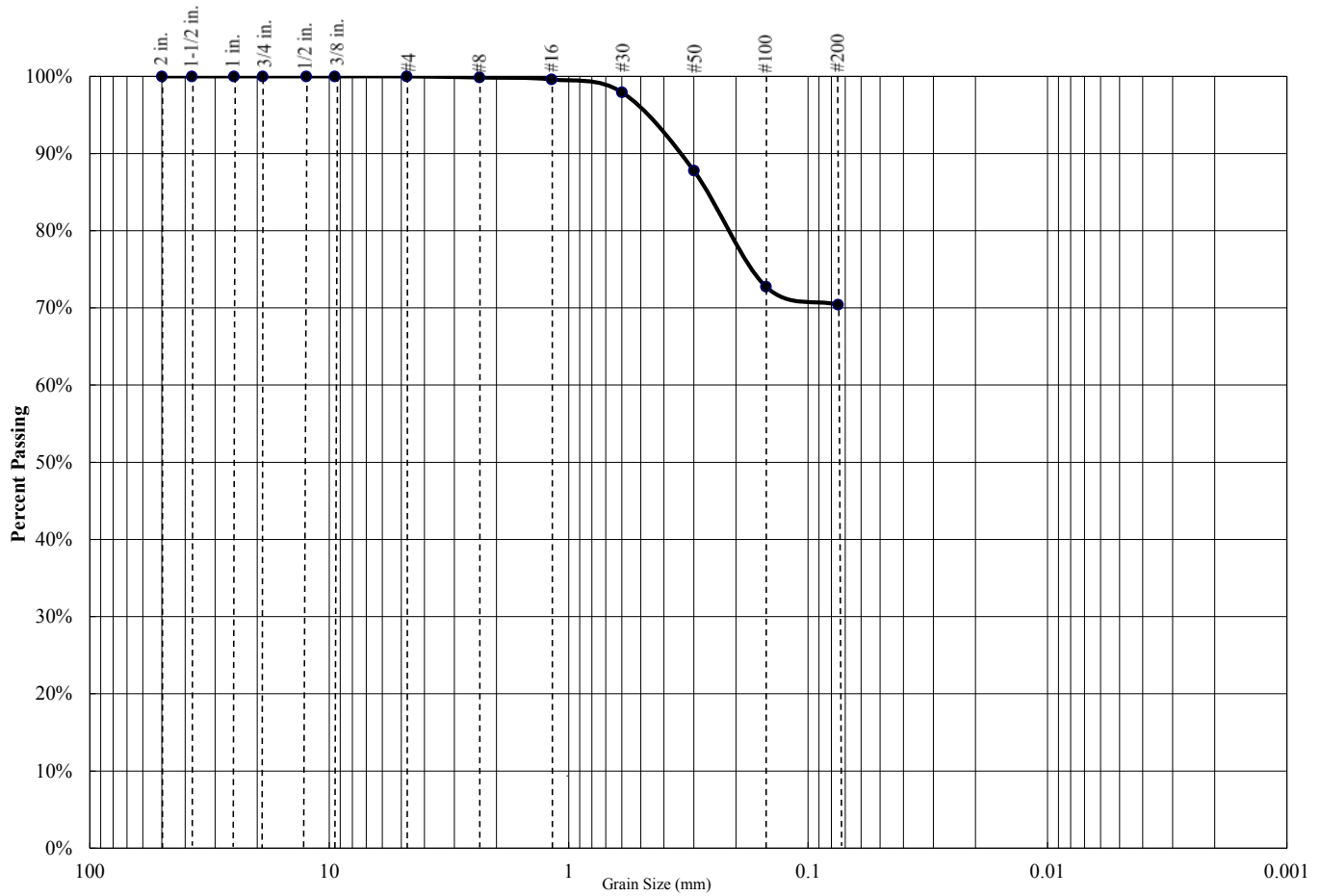
Project Number: 1-220-0546

Boring: B-1 @ 5'



PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
0%	30%	70%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	100.0%
#4	100.0%
#8	99.9%
#16	99.6%
#30	97.9%
#50	87.8%
#100	72.8%
#200	70.4%

Atterberg Limits		
PL=	LL=	PI=

Coefficients		
D85=	D60=	D50=
D30=	D15=	D10=
C _u =	N/A	C _c = N/A

USCS CLASSIFICATION
Sandy Silty CLAY (SC-SM)

Project Name: Classroom Building - Avenal, CA

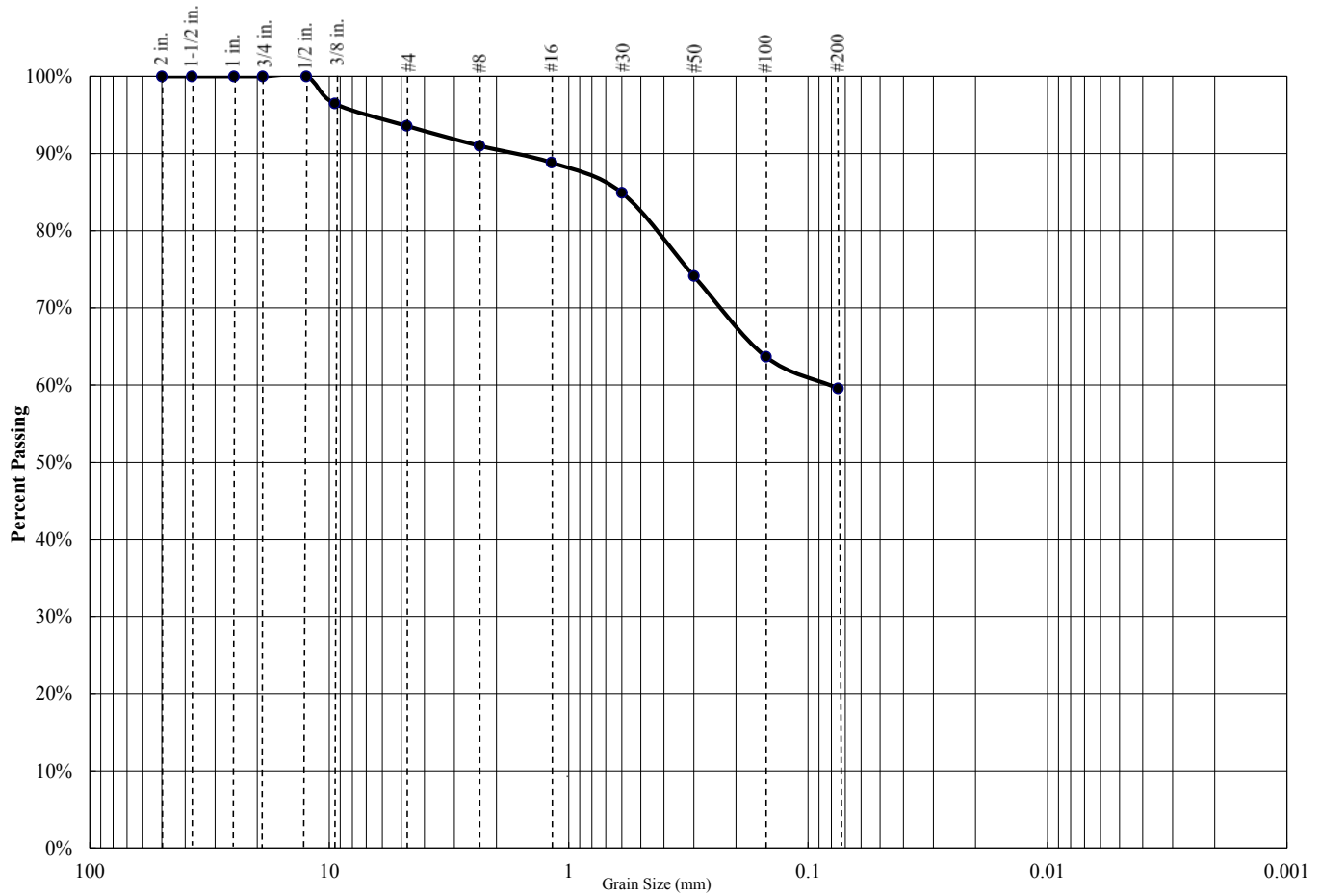
Project Number: 1-220-0546

Boring: B-1 @ 15'



PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
6%	34%	60%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	96.5%
#4	93.6%
#8	91.0%
#16	88.8%
#30	84.9%
#50	74.1%
#100	63.7%
#200	59.6%

Atterberg Limits		
PL=	LL=	PI=

Coefficients		
D85=	D60=	D50=
D30=	D15=	D10=
C _u =	N/A	C _c = N/A

USCS CLASSIFICATION
Sandy Lean CLAY (SC)

Project Name: Classroom Building - Avenal, CA

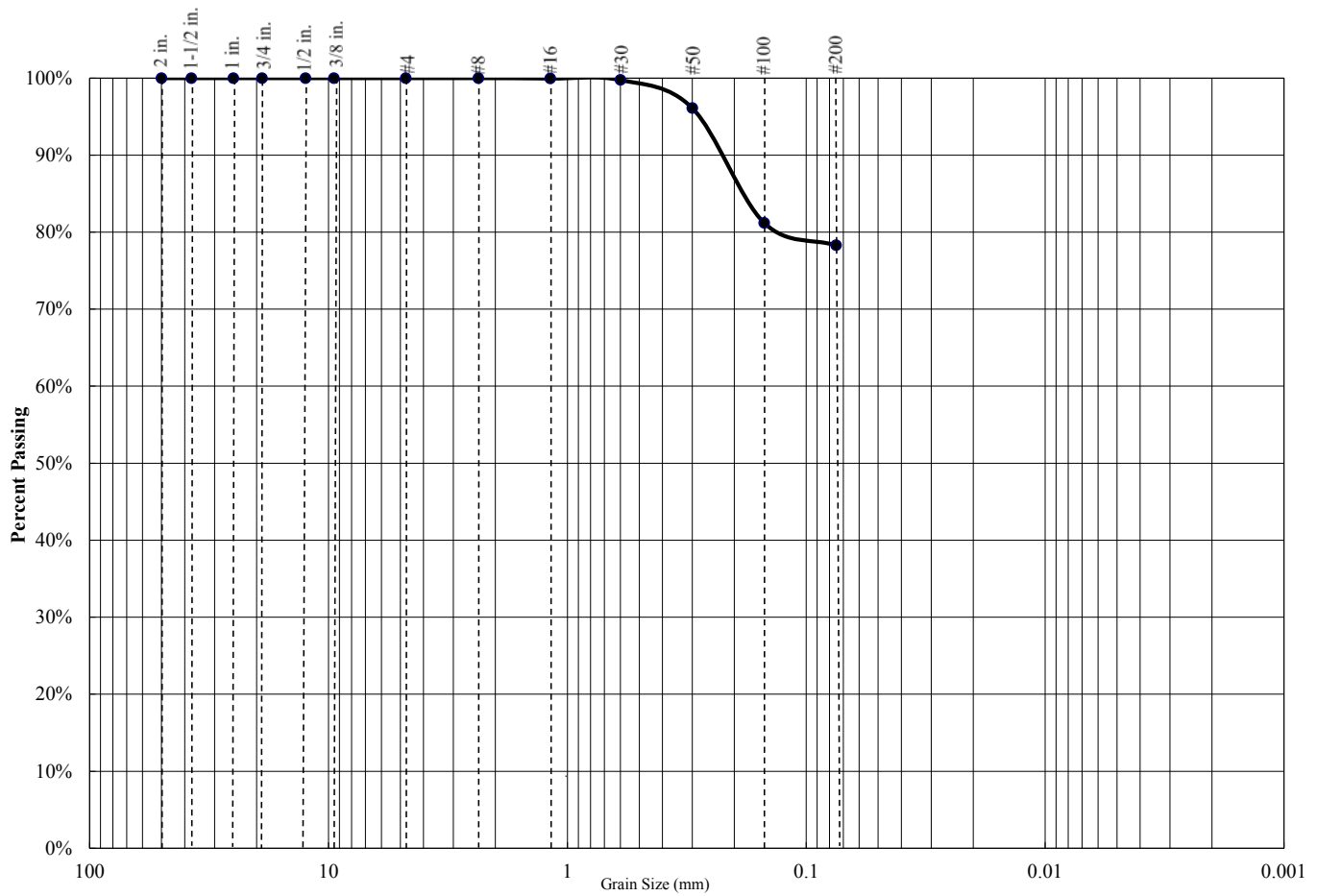
Project Number: 1-220-0546

Boring: B-2 @ 3.5'



PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
0%	22%	78%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	100.0%
#4	100.0%
#8	100.0%
#16	100.0%
#30	99.8%
#50	81.2%
#100	78.3%
#200	78.3%

Atterberg Limits		
PL=	LL=	PI=

Coefficients		
D ₈₅ =	D ₆₀ =	D ₅₀ =
D ₃₀ =	D ₁₅ =	D ₁₀ =
C _u =	N/A	C _c = N/A

USCS CLASSIFICATION
Sandy Silty CLAY (SC-SM)

Project Name: Classroom Building - Avenal, CA

Project Number: 1-220-0546

Boring: B-2 @ 8.5'



CHEMICAL ANALYSIS

SO₄ - Modified CTM 417 & Cl - Modified CTM 417/422

Project Name: Classroom Building - Avenal, CA

Project Number: 1-220-0546

Date Sampled: 7/23/20

Date Tested: 7/27/20

Sampled By: SEG

Tested By: HA

Soil Description: Sandy Lean CLAY

Sample Number	Sample Location	Soluble Sulfate SO ₄ -S	Soluble Chloride Cl	pH
1a.	B-2 @ 0 - 3'	< 50 mg/kg	15 mg/kg	7.8
1b.	B-2 @ 0 - 3'	< 50 mg/kg	16 mg/kg	7.8
1c.	B-2 @ 0 - 3'	< 50 mg/kg	15 mg/kg	7.8
Average:		< 50 mg/kg	15 mg/kg	7.8

SOIL RESISTIVITY

CTM 643

Project Name: Classroom Building - Avenal, CA
 Project Number: 1-220-0546
 Sample Location: B-2 @ 0 - 3'
 Soil Description: Sandy Lean CLAY

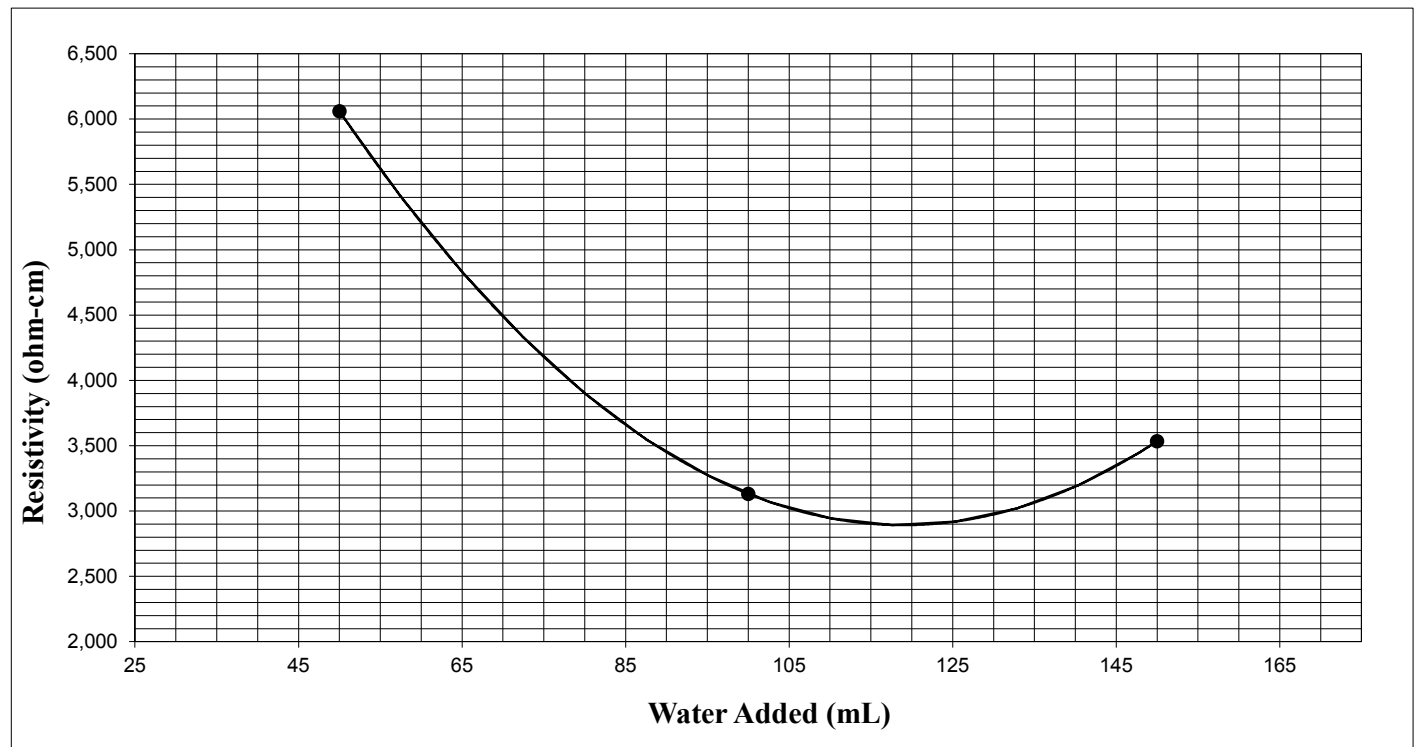
Date Sampled: 7/23/20
 Sampled By: SEG
 Date Tested: 7/27/20
 Tested By: HA

Chloride Content: 15 mg/Kg
 Sulfate Content: < 50 mg/Kg
 Soil pH: 7.8

Initial Sample Weight: 700 gms
 Test Box Constant: 1.010 cm

Test Data:

Trial #	Water Added (mL)	Meter Dial Reading	Multiplier Setting	Resistance (ohms)	Resistivity (ohm-cm)
1	50	6.0	1,000	6,000	6,060
2	100	3.1	1,000	3,100	3,131
3	150	3.5	1,000	3,500	3,535



Minimum Resistivity:	2,892 ohm-cm
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EXPANSION INDEX TEST

ASTM D4829

Project Name: Classroom Building - Avenal, CA

Project Number: 1-220-0546

Date Sampled: 7/23/20

Date Tested: 7/29/20

Sampled By: SEG

Tested By: NL

Sample Location: B-2 @ 0 - 3'

Soil Description: Sandy Lean CLAY

Trial #	1	2	3
Weight of Soil & Mold, g.	593.1		
Weight of Mold, g.	187.8		
Weight of Soil, g.	405.3		
Wet Density, pcf	122.2		
Weight of Moisture Sample (Wet), g.	833.0		
Weight of Moisture Sample (Dry), g.	761.9		
Moisture Content, %	9.3		
Dry Density, pcf	111.8		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	49.7		

Time	Initial	30 min	1 hr	6 hrs	12 hrs	24 hrs
Dial Reading	0	0.0155	0.016	--	--	0.017

Expansion Index_{measured} = 17

Expansion Index₅₀ = 16.9

Expansion Index = 17

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Atterberg Limits Determination

ASTM D4318

Project Name: Classroom Building - Avenal, CA

Project Number: 1-220-0546

Date Sampled: 7/23/20

Date Tested: 7/27/20

Sampled By: SEG

Tested By: IM

Sample Location: B-1 @ 1.5'

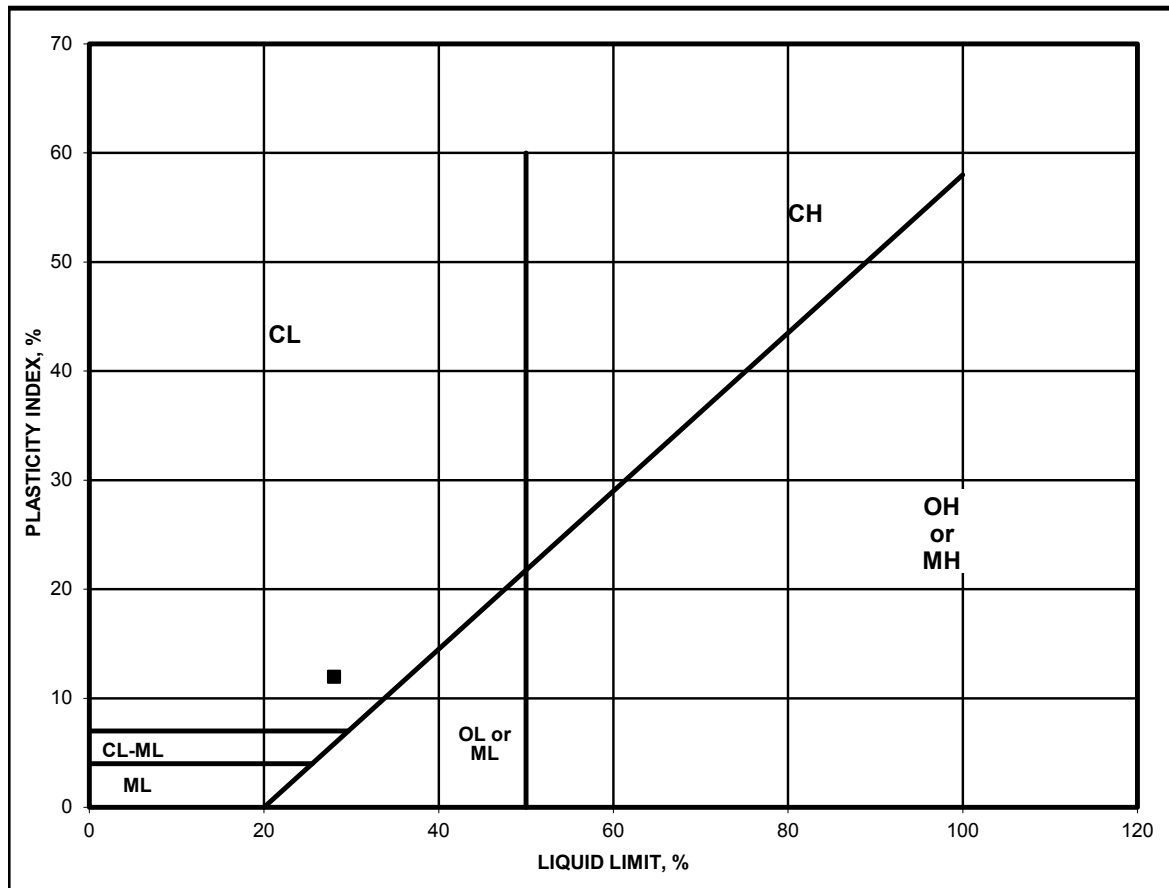
Run Number	Plastic Limit			Liquid Limit		
	1	2	3	1	2	3
Weight of Wet Soil & Tare	28.06	28.53	28.82	32.44	30.46	32.33
Weight of Dry Soil & Tare	27.02	27.53	27.67	29.96	28.34	29.53
Weight of Water	1.04	1.00	1.15	2.48	2.12	2.80
Weight of Tare	20.52	21.01	20.76	20.94	20.79	20.49
Weight of Dry Soil	6.50	6.52	6.91	9.02	7.55	9.04
Water Content	16.0	15.3	16.6	27.5	28.1	31.0
Number of Blows				26	23	19

Plastic Limit : 16

Liquid Limit : 28

Plasticity Index : 12

Unified Soil Classification : CL



Atterberg Limits Determination

ASTM D4318

Project Name: Classroom Building - Avenal, CA

Project Number: 1-220-0546

Date Sampled: 7/23/20

Date Tested: 7/28/20

Sampled By: SEG

Tested By: HA

Sample Location: B-2 @ 3.5'

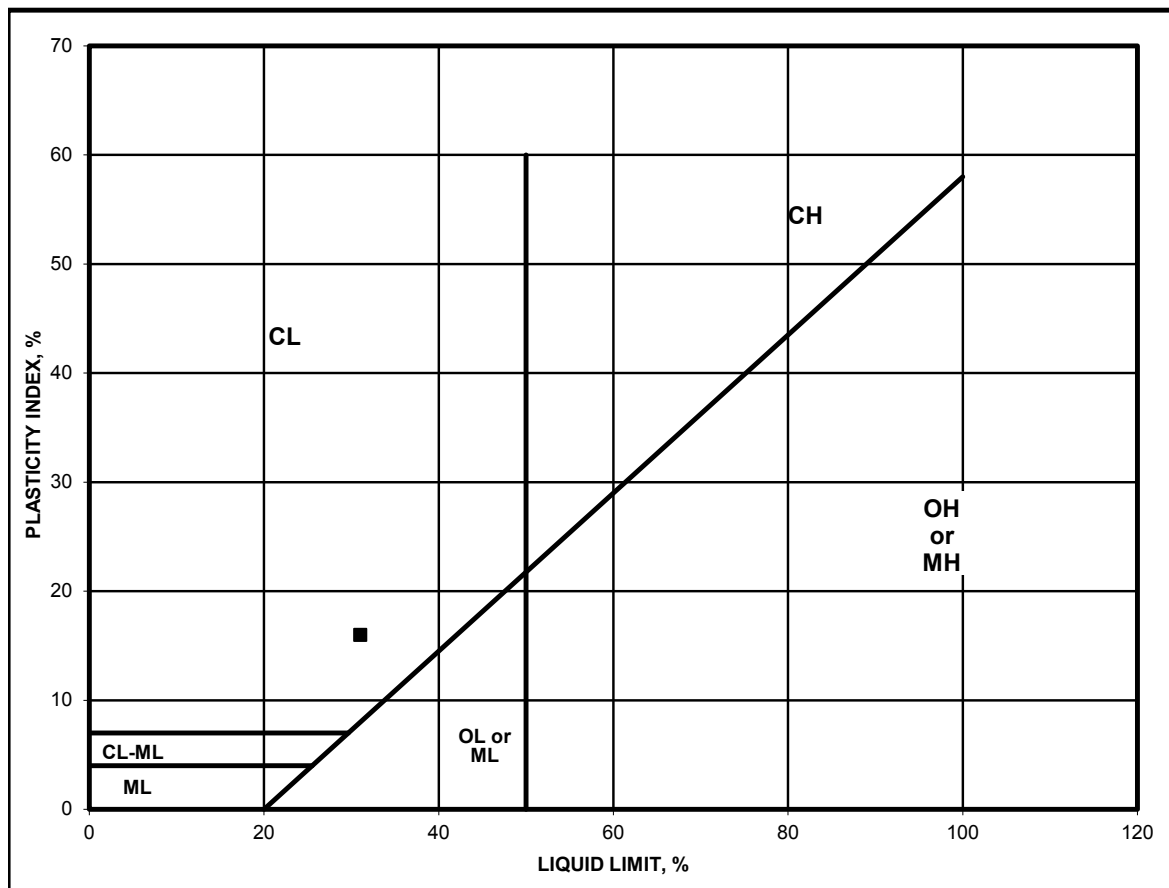
Run Number	Plastic Limit			Liquid Limit		
	1	2	3	1	2	3
Weight of Wet Soil & Tare	26.80	26.71	27.64	27.05	27.37	27.13
Weight of Dry Soil & Tare	25.98	25.95	26.78	25.62	25.81	25.60
Weight of Water	0.82	0.76	0.86	1.43	1.56	1.53
Weight of Tare	20.84	20.67	21.12	20.84	20.93	20.75
Weight of Dry Soil	5.14	5.28	5.66	4.78	4.88	4.85
Water Content	16.0	14.4	15.2	29.9	32.0	31.5
Number of Blows				34	20	19

Plastic Limit : 15

Liquid Limit : 31

Plasticity Index : 16

Unified Soil Classification : CL



Atterberg Limits Determination

ASTM D4318

Project Name: Classroom Building - Avenal, CA

Project Number: 1-220-0546

Date Sampled: 7/23/20

Date Tested: 7/28/20

Sampled By: SEG

Tested By: HA

Sample Location: B-2 @ 8.5'

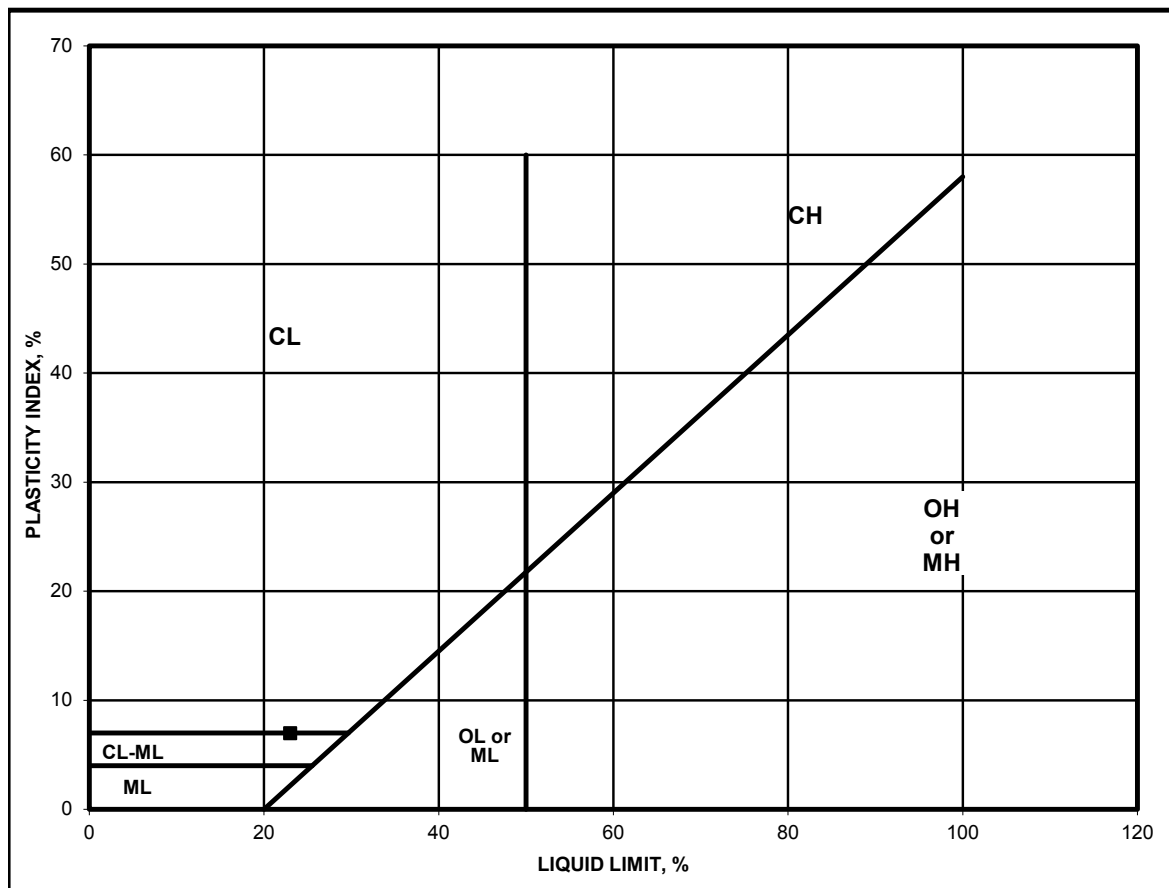
Run Number	Plastic Limit			Liquid Limit		
	1	2	3	1	2	3
Weight of Wet Soil & Tare	28.58	27.40	27.52	30.70	29.55	28.59
Weight of Dry Soil & Tare	27.51	26.46	26.58	28.92	27.93	27.00
Weight of Water	1.07	0.94	0.94	1.78	1.62	1.59
Weight of Tare	20.96	20.67	20.54	21.10	20.93	20.69
Weight of Dry Soil	6.55	5.79	6.04	7.82	7.00	6.31
Water Content	16.3	16.2	15.6	22.8	23.1	25.2
Number of Blows				27	23	16

Plastic Limit : 16

Liquid Limit : 23

Plasticity Index : 7

Unified Soil Classification : CL



APPENDIX

C



APPENDIX C

GENERAL EARTHWORK AND PAVEMENT SPECIFICATIONS

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

1.0 SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including, but not limited to, the furnishing of all labor, tools and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans and disposal of excess materials.

2.0 PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of SALEM Engineering Group, Incorporated, hereinafter referred to as the Soils Engineer and/or Testing Agency. Attainment of design grades, when achieved, shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary adjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer, or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

3.0 TECHNICAL REQUIREMENTS: All compacted materials shall be densified to no less than 95 percent of relative compaction (90 percent for cohesive soils) based on ASTM D1557 Test Method (latest edition), UBC or CAL-216, or as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

4.0 SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the Geotechnical Engineering Report. The Contractor shall make his own interpretation of the data contained in the Geotechnical Engineering Report and the Contractor shall not be relieved of liability for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

5.0 DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or wind-blown materials attributable to his work. Site preparation shall consist of site clearing and grubbing and preparation of foundation materials for receiving fill.

6.0 CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter and all other matter determined by the Soils Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than 1 inch in diameter. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

7.0 SUBGRADE PREPARATION: Surfaces to receive Engineered Fill and/or building or slab loads shall be prepared as outlined above, scarified to a minimum of 12 inches, moisture-conditioned as necessary, and re-compacted to 95 percent relative compaction (90 percent for cohesive soils).

Loose soil areas and/or areas of disturbed soil shall be moisture-conditioned as necessary and re-compacted to 95 percent relative compaction (90 percent for cohesive soils). All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any fill material.

8.0 EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

9.0 FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence or approval of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills, provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

10.0 PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. Compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer. Both cut and fill shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

11.0 SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing, or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill is as specified.

12.0 DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term "Standard Specifications": hereinafter referred to, is the most recent edition of the Standard Specifications of the State of California, Department of Transportation. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as determined by ASTM D1557 Test Method (latest edition) or California Test Method 216 (CAL-216), as applicable.

13.0 PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 95 percent based upon ASTM D1557. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

14.0 AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class II material, ¾-inch or 1½-inches maximum size. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent based upon CAL-216. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

15.0 AGGREGATE SUBBASE - The aggregate subbase shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate subbase material shall conform to the requirements of Section 25 of the Standard Specifications for Class II Subbase material. The aggregate subbase material shall be compacted to a minimum relative compaction of 95 percent based upon CAL-216, and it shall be spread and compacted in accordance with the Standard Specifications. Each layer of aggregate subbase shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

16.0 ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10, unless otherwise stipulated or local conditions warrant more stringent grade. The mineral aggregate shall be Type A or B, ½ inch maximum size, medium grading, and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning, and mixing of the materials shall conform to Section 39. The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with a combination steel-wheel and pneumatic rollers, as described in the Standard Specifications. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine

APPENDIX

D

