Project Manual

For

Davis Elementary School
Modernization Project

5224 East Morada Lane, Stockton, CA 95212

Bidding and Contract Requirements
And
Specifications

for the

Lodi Unified School District
1305 East Vine Street, Lodi, CA 95240

Date: December 2025

PBK Project No.: 230217
DSA Application No.: 02-123250

Construction Documents

Project Manual

for:

Davis Elementary School

Modernization Project

for the

Lodi Unified School District

Date: December 2025

PBK Project No.: 230217
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Construction Documents

Consultants:

Architect:
PBK
1110 Iron Point Road
Suite 200
Folsom, CA 95630-8315
Phone: (916) 355-9922

Structural:
Miyamoto International
1450 Halyard Drive
Suite 1
Sacramento, CA
Phone: (833) 270-8848

Civil:
Warren Consulting Engineers
1117 Windfield Way
Suite 110
El Dorado Hills, CA 95762
Phone: (916) 985-1870

Electrical
LEAF Engineers
1110 Iron Point Road
Suite 200
Folsom, CA 95630-8315
Phone: (916) 355-9922

Landscape:
Yamasaki Landscape Architecture
1223 High Street
Auburn, CA 95603
Phone: (530) 885-0040

LICENSED ARCHITECT ☆ MICHELE GARGANO C-32550 REN. 03-31-2027 ☆ STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER LON M. DETERMAN No. S4654 Exp 6-30-26 STRUCTURAL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ANTHONY J. TASSANO NO. C74696 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER STEVEN C. MUSSER E-19817 Exp. 3-31-2028 ELECTRICAL STATE OF CALIFORNIA

LICENSED LANDSCAPE ARCHITECT THERESA V. ZARO 5124 Signature 8/26 Renewal Date 4/14/25 Date STATE OF CALIFORNIA

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-123250 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 05/06/26

Project Manual Cover Sheet and Seal Page.

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LIST OF SCHEDULES

The following schedule summarizes the major activity dates (Dates are approximate and actual start dates are subject to change):

a. Bid Dates
1. Advertise to Bid (first)
2. Advertise to Bid (second)
3. Pre-Bid Conference/walk
4. RFI Due
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d. Construction

1. Date of facility availability
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e. Occupancy: The Contractor will turn the grounds over for occupancy as follows:

1. Occupancy -

f. Completion/Close-out

1. Substantial Completion Date
2. Complete Minor Finish Work
3. Complete Punch List Work
4. Closeout/Completion

END OF DOCUMENT

DOCUMENT 00 11 16
NOTICE TO BIDDERS

1. Notice is hereby given that the governing board ("Board") of the Lodi Unified School District ("District") will receive sealed bids for the following project, _____ Project No. _____ ("Project" or "Contract"):

2. The Project consists of: _____

3. To bid on this Project, the Bidder is required to possess one or more of the following State of California contractors' license(s)**:**

   "A, B, and/or C-__"

   The Bidder's license(s) must remain active and in good standing throughout the term of the Contract.

4. To bid on this Project, the Bidder is required to be registered as a public works contractor with the Department of Industrial Relations pursuant to the Labor Code.

5. Contract Documents will be available on or after _____, 20__, for review at the District Facilities Office, and may be downloaded from the District's website, https://www.lodiusd.net/about/bonds#facilities, under the **"Facilities and Planning (F&P) Projects"**. In addition, Contract Documents are available for bidders' review at the following builders' exchanges:

   a. Central California Builders Exchange: (559) 237-1831

   b. Builder's Exchange of Stockton: (209) 478-1000

   c. Builder's Exchange of Sacramento: (916) 442-8991

   d. Valley Builders Exchange: (209) 522-9031

6. RESERVED

7. Sealed bids will be received until _a.m./p.m., , 20___, at the District Facilities & Planning Office, 880 N Guild Avenue, Lodi, California 95240 at or after which time the bids will be opened and publicly read aloud. Any bid that is submitted after this time shall be nonresponsive and returned to the bidder. Any claim by a bidder of error in its bid must be made in compliance with section 5100 et seq. of the Public Contract Code.

8. The District reserves the right to prequalify bidders for this Project pursuant to Public Contract Code section 20111.5, as deemed necessary by the District. When prequalification is applied, only prequalified Bidders will be eligible to submit a Bid for this Project. Any Bid submitted by a Bidder who has not been prequalified shall be deemed nonresponsive and will not be considered. Pre-qualification is completed on the web at https://pqbids.com/lodi.

9. Pursuant to Public Contract Code section 20111.6, only prequalified bidders will be eligible to submit a bid for **a public project involving a projected expenditure of $1 million or more using or planning to use state general fund or state**

school bond funds. Any bid submitted by a bidder who is not prequalified shall be non-responsive and returned unopened to the bidder. Moreover, any bid listing subcontractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43 or C-46 licenses for the performance of electrical, mechanical or plumbing components who have not been prequalified shall be deemed nonresponsive.

10. All bids shall be on the form provided by the District. Each bid must conform and be responsive to all pertinent Contract Documents, including, but not limited to, the Instructions to Bidders.

11. A bid bond by an admitted surety insurer on the form provided by the District a cashier's check or a certified check, drawn to the order of the Lodi Unified School District, in the amount of ten percent (10%) of the total bid price, shall accompany the Bid Form and Proposal, as a guarantee that the Bidder will, within seven (7) calendar days after the date of the Notice of Award, enter into a contract with the District for the performance of the services as stipulated in the bid.

12. A mandatory pre-bid conference and site visit will be held on __, 20, at : _.m. at _____, California ("Site Visit"). All participants in a mandatory site visit are required to sign-in. Failure to attend, or tardiness at, a mandatory site visit will render a bid ineligible for consideration. The Site Visit Certification, provided at the end of the Site Visit, must be submitted with the Bid when a site visit is required.

13. The successful Bidder shall be required to furnish a 100% Performance Bond and a 100% Payment Bond if it is awarded the Contract for the Work.

14. The inclusion of an owner-controlled or wrap-up insurance program ("OCIP") for this Project is at the discretion of the District. When the District elects to provide an OCIP, the policy limits, known exclusions, and the duration for which the policy is intended to remain effective are detailed in the OCIP Manual. In such cases, it is mandatory for all bidders to comply with the following minimum requirements: no serious and willful violations of Labor Code section 6300 et seq., a workers' compensation experience modification factor of 1.00 or less, and an instituted injury prevention program pursuant to Labor Code section 3201.5 or 6401.7.

15. Bidders are required to submit the Off-Road Diesel-Fueled Fleet Certification along with their Bids, but only in cases where the project involves the use of off-road diesel-fueled vehicles and equipment subject to regulation. Bids submitted without the Off-Road Diesel-Fueled Fleet Certification, when this certification is applicable to the project, shall be deemed non-responsive and will not be considered.

16. The successful Bidder may substitute securities for any monies withheld by the District to ensure performance under the Contract, in accordance with the provisions of section 22300 of the Public Contract Code.

17. If applicable or required by the District for projects utilizing funds from the State of California School Facility Program, as outlined in Section 17076.11 of the Education Code, there is a mandate to achieve a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%) annually of the overall dollar amount expended on state-funded projects. To fulfill this mandate by demonstrating a good faith effort, Bidders must actively seek DVBE-certified subcontractors and suppliers prior to bid submission. For any state-funded project, the selected Bidder must, upon contract award, certify compliance with DVBE

participation goal procedures. The DVBE Certification Participation Form, provided for this purpose, should not be submitted with the Bid but is required with the execution of the Contract.

This requirement is contingent upon the specific funding and requirements of a project as determined by the District.

18. The Contractor and all Subcontractors under the Contractor shall pay all workers on all Work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to section 1770 et seq. of the California Labor Code. Prevailing wage rates are also available from the District or on the Internet at: <http://www.dir.ca.gov>.

19. This Project is subject to labor compliance monitoring and enforcement by the Department of Industrial Relations pursuant to Labor Code section 1771.4 and subject to the requirements of Title 8 of the California Code of Regulations. The successful Bidder shall comply with all requirements of Division 2, Part 7, Chapter 1, Articles 1-5 of the Labor Code.

20. The District's Board may, pursuant to Public Contract Code section 3400(c), find and determine that certain item(s) must be used on this Project for the reasons outlined below. This designation is subject to Board Resolution and will only be applied based on one of the statutorily allowed bases:

    a. Field Test or Experiment: To determine the product's suitability for future use, the following item(s) have been designated.

    b. Matching Products: To match other products in use on a particular public improvement either completed or in the course of completion, the following item(s) have been designated.

    c. Sole Source Availability: To obtain a necessary item that is only available from one source, the following item(s) have been designated.

    d. Emergency Response: To respond to an emergency declared by a local agency, the following item(s) have been designated.

    The Board has identified the following items which must be used on this Project: [LIST, OR STATE "N/A"].

21. This Project may be funded, in whole or in part, with federal funds. In instances where federal funding is utilized, the Contractor and all Subcontractors under the Contractor are required to comply with the Davis-Bacon Act, applicable reporting requirements, and any other relevant federal funding requirements. Should a conflict arise between state and federal requirements, the more stringent provision shall control to ensure compliance with all applicable regulations..

22. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on:

A. The base bid amount.

23. The Board reserves the right to reject any and all bids and/or waive any irregularity in any bid received. If the District awards the Contract, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

END OF DOCUMENT

DOCUMENT 00 21 13
INSTRUCTIONS TO BIDDERS

Bidders shall follow the instructions in this document, and shall submit all documents, forms, and information required for consideration of a bid.

Lodi Unified School District ("District") will evaluate information submitted by the apparent low Bidder and, if incomplete or unsatisfactory to District, Bidder's bid may be rejected at the sole discretion of District.

1. Bids are requested for a general construction contract, or work described in general, for the following project ("Project" or "Contract"):

   Project Name

2. A Bidder and its subcontractors must possess the appropriate State of California contractors' license and must maintain the license throughout the duration of the project. Bidders must also be registered as a public works contractor with the Department of Industrial Relations pursuant to the Labor Code. Bids submitted by a contractor who is not properly licensed or registered shall be deemed nonresponsive and will not be considered.

3. The District reserves the right to prequalify bidders for this Project pursuant to Public Contract Code section 20111.5, as deemed necessary by the District. When prequalification is applied, only prequalified Bidders will be eligible to submit a Bid for this Project. Any Bid submitted by a Bidder who has not been prequalified shall be deemed nonresponsive and will not be considered.

4. Pursuant to Public Contract Code section 20111.6, only prequalified bidders will be eligible to submit a bid for **a public project involving a projected expenditure of $1 million or more using or planning to use state general fund or state school bond funds**. Any bid submitted by a bidder who is not prequalified shall be non-responsive and returned unopened to the bidder. Moreover, any bid listing subcontractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43 or C-46 licenses for the performance of electrical, mechanical or plumbing components who have not been prequalified shall be deemed nonresponsive.

5. District will receive sealed bids from bidders as stipulated in the Notice to Bidders.

   a. All bids must be sealed in an envelope, marked with the name and address of the Bidder, name of the Project, the Project Number and/or bid number, and time of bid opening.

   b. Bids must be submitted to the **Facilities and Planning Office, 880 N. Guild Avenue, Lodi California 95240** by date and time shown in the Notice to Bidders.

   c. Bids must contain all documents as required herein.

6. Bidders are advised that on the date that bids are opened, telephones will not be available at the District Offices for use by bidders or their representatives.

7. Bids will be opened at or after the time indicated for receipt of bids.

8. Bidders must submit bids on the documents titled Bid Form and Proposal and must submit all other required District forms. Bids not submitted on the District's required forms shall be deemed nonresponsive and shall not be considered. Additional sheets required to fully respond to requested information are permissible.

9. Bidders shall not modify the Bid Form and Proposal or qualify their bids. Bidders shall not submit to the District a re-formatted, re-typed, altered, modified, or otherwise recreated version of the Bid Form and Proposal or other District-provided document.

10. Bids shall be clearly written and without erasure or deletions. District reserves the right to reject any bid containing erasures, deletions, or illegible contents.

11. Bidders must supply all information required by each Bid Document. Bids must be full and complete. District reserves the right in its sole discretion to reject any bid as nonresponsive as a result of any error or omission in the bid. Bidders must complete and submit all of the following documents with the Bid Form and Proposal:

    a. Bid Bond on the District's form, or other security.

    b. Designated Subcontractors List.

    c. Site Visit Certification, if applicable.

    d. Non-Collusion Declaration.

    e. Iran Contracting Act Certification, if applicable.

    f. Off-Road Diesel-Fueled Fleet Certification.

    g. Federal Debarment Certification, if federal funds used.

    h. Federal Byrd Anti-Lobbying Certification, if federal funds used.

    i. OCIP Insurance forms, if District has elected to use OCIP.

12. Bidders must submit with their bids cash, a cashier's check or a certified check payable to District, or a bid bond by an admitted surety insurer of not less than ten percent (10%) of amount of Base Bid, plus all additive alternates ("Bid Bond"). If Bidder chooses to provide a Bid Bond as security, Bidder must use the required form of corporate surety provided by District. The Surety on Bidder's Bid Bond must be an insurer admitted in the State of California and authorized to issue surety bonds in the State of California. Bids submitted without necessary bid security will be deemed nonresponsive and will not be considered.

13. If Bidder to whom the Contract is awarded fails or neglects to enter into the Contract and submit required bonds, insurance certificates, and all other required documents, within **SEVEN (7)** calendar days after the date of the Notice of Award, District may deposit Bid Bond, cash, cashier's check, or certified check for collection, and proceeds thereof may be retained by District as liquidated damages for failure of Bidder to enter into Contract, in the sole discretion of District. It is agreed that calculation of damages District may suffer as a result of Bidder's failure to enter into the Contract would be extremely difficult and impractical to determine and that the

amount of the Bidder's required bid security shall be the agreed and conclusively presumed amount of damages.

14. Bidders must submit with the bid the Designated Subcontractors List for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of total bid. Failure to submit this list when required by law shall result in bid being deemed nonresponsive and the bid will not be considered.

15. All of the listed subcontractors are required to be registered as a public works contractor with the Department of Industrial Relations pursuant to the Labor Code.

    a. An inadvertent error in listing the California contractor license number on the Designated Subcontractors List shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the correct contractor's license number is submitted to the District within 24 hours after the bid opening and the corrected number corresponds with the submitted name and location for that subcontractor.

    b. An inadvertent error listing an unregistered subcontractor shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive provided that any of the following apply:

        (1) The subcontractor is registered prior to the bid opening.

        (2) The subcontractor is registered and has paid the penalty registration fee within 24 hours after the bid opening.

        (3) The subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.

16. If a mandatory pre-bid conference and site visit ("Site Visit") is required as referenced in the Notice to Bidders, then Bidders must submit the Site Visit Certification with their Bid. District will transmit to all prospective Bidders of record such Addenda as District in its discretion considers necessary in response to questions arising at the Site Visit. Oral statements shall not be relied upon and will not be binding or legally effective. Addenda issued by the District as a result of the Site Visit, if any, shall constitute the sole and exclusive record and statement of the results of the Site Visit.

17. Bidders shall submit the Non-Collusion Declaration with their bids. Bids submitted without the Non-Collusion Declaration shall be deemed nonresponsive and will not be considered.

18. Bidders are required to submit the Off-Road Diesel-Fueled Fleet Certification along with their Bids, but only in cases where the Project involves the use of off-road diesel-fueled vehicles and equipment subject to regulation. Bids submitted without the Off-Road Diesel-Fueled Fleet Certification, when this certification is applicable to the Project, shall be deemed non-responsive and will not be considered.

This requirement applies solely to projects for which Off-Road Diesel-Fueled Fleet Certification is relevant due to the nature of the work and the equipment used.

19. The Contractor and all Subcontractors under the Contractor shall pay all workers on all work performed pursuant to the Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the Department of Industrial Relations, are available upon request at the District's principal office. Prevailing wage rates are also available on the internet at http://www.dir.ca.gov.

    This Project may be funded, in whole or in part, with federal funds. In instances where federal funding is utilized, the Contractor and all Subcontractors under the Contractor are required to comply with the Davis-Bacon Act, applicable reporting requirements, and any other relevant federal funding requirements. Should a conflict arise between state and federal requirements, the more stringent provision shall control to ensure compliance with all applicable regulations.

20. If applicable, pursuant to Education Code section 17550, the District may require the Bidder to purchase and to remove from the school grounds all old materials required by the specifications to be removed from any existing school building on the same school grounds and not required for school purposes and to state in his or her bid the amount which he or she will deduct from the price bid for the work as the purchase price of the old materials. In this instance, the board shall let the contract to any responsible bidder whose net bid is the lowest, or shall reject all bids.

21. If the District has elected to provide an owner-controlled insurance policy ("OCIP"), the policy limits, known exclusions, and the duration for which the policy is intended to remain effective are detailed in the OCIP Manual. In such cases, it is mandatory for all bidders to comply with the following minimum requirements: no serious and willful violations of Labor Code section 6300 et seq., a workers' compensation experience modification factor of 1.00 or less, and an instituted injury prevention program pursuant to Labor Code section 3201.5 or 6401.7.

22. If applicable or required by the District for projects utilizing funds from the State of California School Facility Program, as outlined in Section 17076.11 of the Education Code, there is a mandate to achieve a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%) annually of the overall dollar amount expended on state-funded projects. To fulfill this mandate by demonstrating a good faith effort, Bidders must actively seek DVBE-certified subcontractors and suppliers prior to bid submission. For any state-funded project, the selected Bidder must, upon contract award, certify compliance with DVBE participation goal procedures. The DVBE Certification Participation Form, provided for this purpose, should not be submitted with the Bid but is required with the execution of the Contract.

23. Submission of bid signifies careful examination of Contract Documents and complete understanding of the nature, extent, and location of Work to be performed. Bidders must 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, if required, 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 Sum, within the Contract Time, and in accordance with the other terms and conditions of 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, tests, 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 the actual conditions, and the written resolution(s) thereof by the District is/are acceptable to Bidder;

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;

f. Bidder must, prior to bidding, perform the work, investigations, research, and analysis required by this document and that Bidder represented in its Bid Form and Proposal and the Agreement that it performed prior to bidding. Contractor under this Contract 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.

g. Conditions Shown on the Contract Documents: Information as to underground conditions, as-built conditions, or other conditions or obstructions, indicated in the Contract Documents, e.g., on Drawings or in Specifications, has been obtained with reasonable care, and has been recorded in good faith. However, District only warrants, and Bidder may only rely, on the accuracy of limited types of information.

(1) 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 Bidder is required to make such verification as a condition to bidding. In submitting its Bid, Bidder shall rely on the results of its own independent investigation. In submitting its Bid, Bidder shall not rely on District-supplied information regarding above-ground conditions or as-built conditions.

(2) As to any subsurface condition shown or indicated in the Contract Documents, Bidder 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 that the Bidder has 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).

h. Conditions Shown in Reports and Drawings Supplied for Informational Purposes: Reference is made to the document entitled Geotechnical Data, and the document entitled Existing Conditions, for identification of:

(1) Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by Architect in preparing the Contract Documents; and

(2) Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that has been utilized by Architect in preparing the Contract Documents.

(3) These reports and drawings are **not** Contract Documents and, except for any "technical" data regarding subsurface conditions specifically identified in Geotechnical Data and Existing Conditions, and underground facilities data, Bidder may not in any manner rely on the information in these reports and drawings. Subject to the foregoing, Bidder must make its own independent investigation of all conditions affecting the Work and must not rely on information provided by District.

24. Bids shall be based on products and systems specified in Contract Documents or listed by name in Addenda. Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words "or equal." Bidder may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified. The District is not responsible and/or liable in any way for a Contractor's damages and/or claims related, in any way, to that Contractor's basing its bid on any requested substitution that the District has not approved in advance and in writing.

Contractors and materials suppliers who submit requests for substitutions prior to the award of the Contract must do so in writing and in compliance with Public Contract Code section 3400. All requests must comply with the following:

a. District must receive any notice of request for substitution of a specified item a minimum of **TEN (10)** calendar days prior to bid opening. The Successful Bidder will not be allowed to substitute specified items unless properly noticed.

b. Within 35 days after the date of the Notice of Award, the Successful Bidder shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the Specifications. Insufficient information shall be grounds for rejection of substitution.

c. Approved substitutions, if any, shall be listed in Addenda. District reserves the right not to act upon submittals of substitutions until after bid opening.

d. Substitutions may be requested after Contract has been awarded only if indicated in and in accordance with requirements specified in the Special Conditions and the Specifications.

25. Bidders may examine any available "as-built" drawings of previous work by giving District reasonable advance notice. District will not be responsible for accuracy of "as-built" drawings. The document entitled Existing Conditions applies to all supplied "as-built" drawings.

26. All questions about the meaning or intent of the Contract Documents are to be directed via email to the District to _____. Interpretations or clarifications considered necessary by the District in response to such questions will be issued in writing by Addenda and emailed, faxed, mailed, or delivered to all parties recorded by the District as having received the Contract Documents or posted on the District's website https://www.lodiusd.net/about/bonds#facilities. Questions received less than **SEVEN (7)** calendar days prior to the date for opening bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

27. Addenda may also be issued to modify other parts of the Contract Documents as deemed advisable by the District.

28. Each Bidder must acknowledge each Addendum in its Bid Form and Proposal by number or its Bid shall be considered non-responsive. Each Addendum shall be part of the Contract Documents. A complete listing of Addenda may be secured from the District.

29. This Contract may include alternates. Alternates are defined as alternate products, materials, equipment, systems, methods, or major elements of the construction that may, at the District's option and under terms established in the Contract and pursuant to section 20103.8 of the Public Contract Code, be selected for the Work.

30. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on the criteria as indicated in the Notice to Bidders. In the

event two or more responsible bidders submit identical bids, the District shall select the Bidder to whom to award the Contract by lot.

31. Discrepancies between written words and figures, or words and numerals, will be resolved in favor of figures or numerals.

32. Bidders in contention for contract awards shall be required to attend a Post-Bid interview, which will be set within three (3) calendar days following bid opening. A duly authorized representative of the apparent low bidder is required to attend the Post Bid Interview, in person. The apparent low bidder's authorized representative(s) must have (1) knowledge of how the bid submitted was prepared, (2) the person responsible for supervising performance of the Work, and (3) the authority to bind the apparent low bidder. Failure to attend the Post Bid Interview as scheduled will be considered just cause for the District to reject the Bid as nonresponsive.

33. Any bid protest by any Bidder regarding any other bid must be submitted in writing to the District, before 5:00 p.m. of the **THIRD (3rd)** business day following bid opening.

    a. Only a Bidder who has actually submitted a bid, and who could be awarded the Contract if the bid protest is upheld, is eligible to submit a bid protest. Subcontractors are not eligible to submit bid protests. A Bidder may not rely on the bid protest submitted by another Bidder.

    b. A bid protest must contain a complete statement of any and all bases for the protest and all supporting documentation. Materials submitted after the bid protest deadline will not be considered.

    c. The protest must refer to the specific portions of all documents that form the basis for the protest.

        (1) Without limitation to any other basis for protest, an inadvertent error in listing the California contractor's license number on the Designated Subcontractors List shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the correct contractor's license number is submitted to the District within 24 hours after the bid opening and the corrected number corresponds with the submitted name and location for that subcontractor.

        (2) Without limitation to any other basis for protest, an inadvertent error listing an unregistered subcontractor shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive provided that any of the following apply:

            (a) The subcontractor is registered prior to the bid opening.

            (b) The subcontractor is registered and has paid the penalty registration fee within 24 hours after the bid opening.

            (c) The subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.

d. The protest must include the name, address and telephone number of the person representing the protesting party.

e. The party filing the protest must concurrently transmit a copy of the protest and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all other bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

f. The procedure and time limits set forth in this paragraph are mandatory and are each bidder's sole and exclusive remedy in the event of bid protest. Failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

34. The Bidder to whom Contract is awarded shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7th)** calendar day following the date of the Notice of Award. Failure to properly and timely submit these documents entitles District to reject the bid as nonresponsive.

a. Agreement: To be executed by successful Bidder. Submit four (4) copies, each bearing an original signature. If approved by the District, a facsimile or electronic signature shall be deemed to be the equivalent of the actual original signature.

b. Escrow of Bid Documentation: This must include all required documentation. See the document titled Escrow Bid Documentation for more information.

c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

d. Payment Bond (Contractor's Labor and Material Bond) (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

e. Insurance Certificates and Endorsements as required.

f. Workers' Compensation Certification.

g. Prevailing Wage and Related Labor Requirements Certification.

h. Disabled Veteran Business Enterprise Participation Certification. *(If applicable)*

i. Drug-Free Workplace Certification. *(If applicable)*

j. Tobacco-Free Environment Certification. *(If applicable)*

k. Drug and Alcohol-Free Schools Certification. *(If applicable)*

l. Hazardous Materials Certification. *(If applicable)*

m. Lead-Based Materials Certification. *(If applicable)*

n. Imported Materials Certification. *(If applicable)*

o. Criminal Background Investigation/Fingerprinting Certification.

p. Roofing Project Certification: from Contractor, Material Manufacturer and/or Vendor. *(If applicable)*

q. Registered Subcontractors List: Must include Department of Industrial Relations (DIR) registration number of each subcontractor for all tiers.

35. Time for Completion: District may issue a Notice to Proceed within **NINETY (90)** days from the date of the Notice of Award. Once Contractor has received the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents.

a. In the event that the District desires to postpone issuing the Notice to Proceed beyond this 90-day period, it is expressly understood that with reasonable notice to the Contractor, the District may postpone issuing the Notice to Proceed.

b. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed beyond a 90-day period. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to the Contractor, the Contractor may terminate the Contract. Contractor's termination due to a postponement beyond this 90-day period shall be by written notice to District within **TEN (10)** calendar days after receipt by Contractor of District's notice of postponement.

c. It is further understood by the Contractor that in the event that Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement and which the District had in writing authorized Contractor to perform prior to issuing a Notice to Proceed.

d. Should the Contractor terminate the Contract as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible bidder.

36. District reserves the right to reject any or all bids, including without limitation the right to reject any or all nonconforming, nonresponsive, unbalanced, or conditional bids, to re-bid, and to reject the bid of any bidder if District believes that it would not be in the best interest of the District to make an award to that bidder, whether because the bid is not responsive or the bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by District. District also reserves the right to waive any inconsequential deviations or irregularities in any bid. For purposes of this paragraph, an "unbalanced bid" is one having nominal prices for some work items and/or enhanced prices for other work items.

37. It is the policy of the District that no qualified person shall be excluded from participating in, be denied the benefits of, or otherwise be subjected to discrimination in any consideration leading to the award of contract, based on race, religious creed, color, national origin, ancestry, physical disability, mental disability, reproductive health decision-making, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or veteran or military status. The Successful Bidder and its subcontractors shall comply with applicable federal and state laws, including, but not limited to the California Fair Employment and Housing Act, beginning with Government Code section 12900, and Labor Code section 1735.

38. Prior to the award of Contract, District reserves the right to consider the responsibility of the Bidder. District may conduct investigations as District deems necessary to assist in the evaluation of any bid and to establish the responsibility, including, without limitation, qualifications and financial ability of Bidders, proposed subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to District's satisfaction within the prescribed time.

END OF DOCUMENT

DOCUMENT 00 21 13.1

BIDDER INFORMATION AND FORMS

[INTENTIONALLY LEFT BLANK UNLESS PROVIDED IN SPECIAL CONDITIONS – SEPARATE PREQUALIFICATION PROCESS RECOMMENDED]

END OF DOCUMENT

DOCUMENT 00 31 19
EXISTING CONDITIONS

1. Summary

This document describes existing conditions at or near the Project, and use of information available regarding existing conditions. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein.

2. Reports and Information on Existing Conditions

a. Documents providing a general description of the Site and conditions of the Work may have been collected by the Lodi Unified School District ("District"), its consultants, contractors, and tenants. These documents may, but are not required to, include previous contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding underground facilities.

b. Information regarding existing conditions may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports, documents, and other information are **not** part of the Contract Documents. These reports, documents, and other information do **not** excuse Contractor from fulfilling Contractor's obligation to independently investigate any or all existing conditions or from using reasonable prudent measures to avoid damaging existing improvements.

c. Information regarding existing conditions may also be included in the Project Manual, but shall **not** be considered part of the Contract Documents.

d. Prior to commencing this Work, Contractor and the District's representative shall survey the Site to document the condition of the Site. Contractor will record the survey in digital videotape format and provide an electronic copy to the District within fourteen (14) days of the survey.

e. Contractor may also document any pre-existing conditions in writing, provided that both the Contractor and the District's representative agree on said conditions and sign a memorandum documenting the same.

f. The reports and other data or information regarding existing conditions and underground facilities at or contiguous to the Project are the following:

(1) Original Construction Drawings.
(2) Survey of Site.
(3) Geotechnical Report(s).
(4) Hazardous Material Report(s).
(5) Videotaped Survey(s).

3. Use of Information

a. Information regarding existing conditions was obtained only for use of District and its consultants, contractors, and tenants for planning and design and is **not** part of the Contract Documents.

b. District does not warrant, and makes no representation regarding, the accuracy or thoroughness of any information regarding existing conditions. Bidder represents and agrees that in submitting a bid it is not relying on any information regarding existing conditions supplied by District.

c. Under no circumstances shall District be deemed to warrant or represent existing above-ground conditions, as-built conditions, or other actual conditions, verifiable by independent investigation. These conditions are verifiable by Bidder by the performance of its own independent investigation that Bidder must perform as a condition to bidding and Bidder should not and shall not rely on this information or any other information supplied by District regarding existing conditions.

d. Any information shown or indicated in the reports and other data supplied herein with respect to existing underground facilities at or contiguous to the Project may be based upon information and data furnished to District by the District's employees and/or consultants or builders of such underground facilities or others. District does not assume responsibility for the completeness of this information, and Bidder is solely responsible for any interpretation or conclusion drawn from this information.

e. District shall be responsible only for the general accuracy of information regarding underground facilities, and only for those underground facilities that are owned by District, and only where Bidder has conducted the independent investigation required of it pursuant to the Instructions to Bidders, and discrepancies are not apparent.

4. **Investigations/Site Examinations**

a. Before submitting a bid, each Bidder is responsible for conducting or obtaining any additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise, that 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 or that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of Contract Documents.

b. On request, District will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a bid. Bidders must fill all holes and clean up and restore the Site to its former condition upon completion of its explorations, investigations, tests, and studies. Such investigations and Site examinations may be performed during any and all Site visits indicated in the Notice to Bidders and only under the provisions of the Contract Documents, including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such work, and District’s prior approval.

END OF DOCUMENT

DOCUMENT 00 31 32
GEOTECHNICAL DATA

1. **Summary**

This document describes geotechnical data at or near the Project that is in the District's possession available for Contractor's review, and use of data resulting from various investigations. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein.

2. **Geotechnical Reports**

a. Geotechnical reports may have been prepared for and around the Site and/or in connection with the Work by soil investigation engineers hired by Lodi Unified School District ("District"), and its consultants, contractors, and tenants.

b. Geotechnical reports may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports are **not** part of the Contract Documents.

c. The reports and drawings of physical conditions that may relate to the Project are the following:

_____

3. **Use of Data**

a. Geotechnical data were obtained only for use of District and its consultants, contractors, and tenants for planning and design and are **not** a part of Contract Documents.

b. Except as expressly set forth below, District does not warrant, and makes no representation regarding, the accuracy or thoroughness of any geotechnical data. Bidder represents and agrees that in submitting a bid it is not relying on any geotechnical data supplied by District, except as specifically allowed below.

c. Under no circumstances shall District be deemed to make a warranty or representation of existing above ground conditions, as-built conditions, geotechnical conditions, or other actual conditions verifiable by independent investigation. These conditions are verifiable by Bidder by the performance of its own independent investigation that Bidder should perform as a condition to bidding and Bidder must not and shall not rely on information supplied by District.

4. **Limited Reliance Permitted on Certain Information**

a. Reference is made herein for identification of:

Reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by District in preparation of the Contract Documents.

Drawings of physical conditions in or relating to existing subsurface structures (except underground facilities) that are at or contiguous to the Site and have been utilized by District in preparation of the Contract Documents.

b. Bidder may rely upon the general accuracy of the "technical data" contained in the reports and drawings identified above, but only insofar as it relates to subsurface conditions, provided Bidder has conducted the independent investigation required pursuant to Instructions to Bidders, and discrepancies are not apparent. The term "technical data" in the referenced reports and drawings shall be limited as follows:

(1) The term "technical data" shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment or structures that were encountered during subsurface exploration. The term "technical data" does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures.

(2) The term "technical data" shall not include the location of underground facilities.

(3) Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder may rely upon the general accuracy of the "technical data" contained in such reports or drawings.

(4) Bidder is solely responsible for any interpretation or conclusion drawn from any "technical data" or any other data, interpretations, opinions, or information provided in the identified reports and drawings.

5. **Investigations/Site Examinations**

a. Before submitting a bid, each Bidder is responsible for conducting or obtaining any additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise, that 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 or that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of Contract Documents.

b. On request, District will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a bid. Bidders must fill all holes and clean up and restore the Site to its former condition upon completion of its explorations, investigations, tests, and studies. Such investigations and Site examinations may be performed during any and all Site visits indicated in the Notice to Bidders and only under the provisions of the Contract Documents, including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such work, and District's prior approval.

END OF DOCUMENT

DOCUMENT 00 41 13

BID FORM AND PROPOSAL

To: Governing Board of the Lodi Unified School District ("District" or "Owner")

From: _____
(Proper Name of Bidder)

The undersigned declares that Bidder has read and understands the Contract Documents, including, without limitation, the Notice to Bidders and the Instructions to Bidders, and agrees and proposes to furnish all necessary labor, materials, and equipment to perform and furnish all work in accordance with the terms and conditions of the Contract Documents, including, without limitation, the Drawings and Specifications for the following project known as:

PROJECT NAME PROJECT NO.

("Project" or "Contract") and will accept in full payment for that Work the following total lump sum amount, all taxes included:

_____ dollars $ _____ ***BASE BID WITHOUT CONTINGENCY***
_____ dollars $ _____ ***10% OWNER-CONTROLLED CONTINGENCY***
_____ dollars $ _____ ***TOTAL BID WITH CONTINGENCY***

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Additional Detail Regarding Calculation of Base Bid

1. **Contingency**. A 10% owner-controlled contingency shall be added to the Base Bid ("Contingency"). For example, a $10 Contingency should be added to a $100 Base Bid, for a Total Bid of $110. The Contingency shall apply to potential additional construction costs for unforeseen conditions that occur over the course of construction and/or scope gaps between the subcontract categories of the Work. The Contingency is not intended for such things as scope changes. The Contingency shall not be used without the agreement of the District. The unused portion of the Contingency shall be considered as cost savings and retained by the District at the end of the Project.

2. The undersigned has reviewed the Work outlined in the Contract Documents and fully understands the scope of Work required in this Proposal, understands the construction and project management function(s) is described in the Contract Documents, and that each Bidder who is awarded a contract shall be in fact a prime contractor, not a subcontractor, to the District, and agrees that its Proposal, if accepted by the District, will be the basis for the Bidder to enter into a contract with the District in accordance with the intent of the Contract Documents.

3. The undersigned has notified the District in writing of any discrepancies or omissions or of any doubt, questions, or ambiguities about the meaning of any of the Contract Documents and has contacted the Construction Manager before bid date to verify the issuance of any clarifying Addenda.

4. The undersigned agrees to commence work under this Contract on the date established in the Contract Documents and to complete all work within the time specified in the Contract Documents.

5. The liquidated damages clause of the General Conditions and Agreement is hereby acknowledged.

6. It is understood that the District reserves the right to reject this bid and that the bid shall remain open to acceptance and is irrevocable for a period of ninety (90) days.

7. The following documents are attached hereto:

   - Bid Bond on the District's form or other security
   - Addendum Acknowledgement
   - Registered Subcontractors List
   - Site Visit Certification *(If applicable)*
   - Non-Collusion Declaration
   - Off-Road Diesel-Fueled Fleet Certification
   - OCIP Insurance forms *(If applicable)*
   - Federal Debarment Certification *(If applicable)*
   - Federal Byrd Anti-Lobbying Certification *(If applicable)*

8. Receipt and acceptance of the following Addenda is hereby acknowledged:

No. _____, Dated _____	No. _____, Dated _____
No. _____, Dated _____	No. _____, Dated _____
No. _____, Dated _____	No. _____, Dated _____

9. Bidder acknowledges that the license required for performance of the Work is a(n) "A, B, and/or C-__" license.

10. Bidder hereby certifies that Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

11. Bidder specifically acknowledges and understands that if it is awarded the Contract, that it shall perform the Work of the Project while complying with all requirements of the Department of Industrial Relations.

12. Bidder hereby certifies that its bid includes sufficient funds to permit Bidder to comply with all local, state or federal labor laws or regulations during the Project, including payment of prevailing wage, and that Bidder will comply with the provisions of Labor Code section 2810(d) if awarded the Contract.

13. If the District has entered into a Project Labor Agreement, Bidder agrees to comply with all requirements of the Project Labor Agreement.

14. In instances where the project is funded, in whole or in part, by federal funds, Bidder specifically acknowledges and understands that if it is awarded the Contract, that it shall perform the Work of the Project while complying with the Davis Bacon Act, applicable reporting requirements, and any and all other applicable requirements for federal funding. If a conflict exists, the more stringent requirement shall control.

15. Bidder represents that it is competent, knowledgeable, and has special skills with respect to the nature, extent, and inherent conditions of the Work to be performed. Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the Work that may create, during the Work, unusual or peculiar unsafe conditions hazardous to persons and property.

16. Bidder expressly acknowledges that it is aware of such peculiar risks and that it has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the Work with respect to such hazards.

17. Bidder expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Gov. Code, § 12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.

18. The undersigned Bidder certifies that it is, at the time of bidding, and shall be throughout the period of the Contract, licensed by the State of California to do the type of work required under the terms of the Contract Documents and registered as a public works contractor with the Department of Industrial Relations. Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.

Bidder hereby certifies to the District that all representations, certifications, and statements made by Bidder, as set forth in this bid form, are true and correct and are made under penalty of perjury.

Dated this _____ day of _____ 20 ____

Name of Bidder: _____

Type of Organization: _____

Signature: _____

Print Name: _____

Title: _____

Address of Bidder: _____

Taxpayer Identification No. of Bidder: _____

Telephone Number: _____

Fax Number: _____

E-mail: _____ Web Page: _____

Contractor's License No(s): No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class:_____ Expiration Date: _____

No.: _____ Class:_____ Expiration Date: _____

Public Works Contractor Registration No.: _____

END OF DOCUMENT

DOCUMENT 00 43 13
BID BOND

(Note: If Bidder is providing a bid bond as its bid security, Bidder must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

That the undersigned,_____, as Principal ("Principal"),

and _____, as Surety ("Surety"), a corporation organized and existing under and by virtue of the laws of the State of California and authorized to do business as a surety in the State of California, are held and firmly bound unto the Lodi Unified School District ("District") of San Joaquin County, State of California, as Obligee, in an amount equal to ten percent (10%) of the Base Bid plus alternates, in the sum of

_____ Dollars ($ _____)

lawful money of the United States of America, for the payment of which sum well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted a bid to the District for all Work specifically described in the accompanying bid for the following project: _____ ("Project" or "Contract").

NOW, THEREFORE, if the Principal is awarded the Contract and, within the time and manner required under the Contract Documents, after the prescribed forms are presented to Principal for signature, enters into a written contract, in the prescribed form in accordance with the bid, and files two bonds, one guaranteeing faithful performance and the other guaranteeing payment for labor and materials as required by law, and meets all other conditions to the Contract between the Principal and the Obligee becoming effective, or if the Principal shall fully reimburse and save harmless the Obligee from any damage sustained by the Obligee through failure of the Principal to enter into the written contract and to file the required performance and labor and material bonds, and to meet all other conditions to the Contract between the Principal and the Obligee becoming effective, then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect. The full payment of the sum stated above shall be due immediately if Principal fails to execute the Contract within seven (7) days of the date of the District's Notice of Award to Principal.

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, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or the call for bids, or to the work, or to the specifications.

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

If the District awards the bid, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

IN WITNESS WHEREOF, this instrument has been duty executed by the Principal and Surety above named, on the _____ day of _____, 20___.

_____
Principal

_____
By

_____
Surety

_____
By

_____
Name of California Agent of Surety

_____
Address of California Agent of Surety

_____
Telephone Number of California Agent of Surety

Bidder must attach Power of Attorney and Certificate of Authority for Surety and a Notarial Acknowledgment for all Surety's signatures. The California Department of Insurance must authorize the Surety to be an admitted Surety Insurer.

END OF DOCUMENT

DOCUMENT 00 43 36

DESIGNATED SUBCONTRACTORS LIST

(Public Contact Code Sections 4100-4114)

PROJECT: **Project Name Project No.**

Bidder acknowledges and agrees that it must clearly set forth below the name, location and California contractor license number of each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the Work or who will specially fabricate and install a portion of the Work according to detailed drawings contained in the plans and specifications in an amount in excess of one-half of one percent (0.5%) of Bidder's total Base Bid and the kind of Work that each will perform. Vendors or suppliers of materials only do not need to be listed.

Bidder acknowledges and agrees that, if Bidder fails to list as to any portion of Work, or if Bidder lists more than one subcontractor to perform the same portion of Work, Bidder must perform that portion itself or be subjected to penalty under applicable law. In case more than one subcontractor is named for the same kind of Work, state the portion of the kind of Work that each subcontractor will perform.

If alternate bid(s) is/are called for and Bidder intends to use subcontractors different from or in addition to those subcontractors listed for work under the Base Bid, Bidder must list subcontractors that will perform Work in an amount in excess of one half of one percent (0.5%) of Bidder's total Base Bid plus alternate(s).

If further space is required for the list of proposed subcontractors, attach additional copies of page 2 showing the required information, as indicated below.

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 01

SITE VISIT CERTIFICATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID
IF SITE VISIT WAS MANDATORY

PROJECT: **Project Name Project No.**

Check option that applies:

_____ I certify that I visited the Site of the proposed Work, received the attached _____ pages of information, and became fully acquainted with the conditions relating to construction and labor. I fully understand the facilities, difficulties, and restrictions attending the execution of the Work under contract.

_____ I certify that _____ (Bidder's representative) visited the Site of the proposed Work, received the attached _____ pages of information, and became fully acquainted with the conditions relating to construction and labor. The Bidder's representative fully understood the facilities, difficulties, and restrictions attending the execution of the Work under contract.

Bidder fully indemnifies the Lodi Unified School District, its Architect, its Engineers, its Construction Manager, and all of their respective officers, agents, employees, and consultants from any damage, or omissions, related to conditions that could have been identified during my visit and/or the Bidder's representative's visit to the Site.

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

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

ATTACHMENTS:

1.

2.

3.

END OF DOCUMENT

DOCUMENT 00 45 19

NON-COLLUSION DECLARATION

(Public Contract Code Section 7106)

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.
[Title] [Name of Firm]

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

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

at _____, _____.
[City] [State]

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 19.01

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code Sections 2202-2208)

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Prior to bidding on or submitting a proposal for a contract for goods or services of $1,000,000 or more, the bidder/proposer must submit this certification pursuant to Public Contract Code section 2204.

The bidder/proposer must complete **ONLY ONE** of the following two options. To complete OPTION 1, check the corresponding box **and** complete the certification below. To complete OPTION 2, check the corresponding box, complete the certification below, and attach documentation demonstrating the exemption approval.

☐ **OPTION 1.** Bidder/Proposer is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b), and we are not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

☐ **OPTION 2.** Bidder/Proposer has received a written exemption from the certification requirement pursuant to Public Contract Code sections 2203(c) and (d). *A copy of the written documentation demonstrating the exemption approval is included with our bid/proposal.*

CERTIFICATION:

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY, that I am duly authorized to legally bind the bidder/proposer to the OPTION selected above. This certification is made under the laws of the State of California.

Vendor Name/Financial Institution (Printed)	*Federal ID Number (or n/a)*
By (Authorized Signature)	
Printed Name and Title of Person Signing	*Date Executed*

END OF DOCUMENT

DOCUMENT 00 45 19.02

OFF-ROAD DIESEL-FUELED FLEET CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Title 13 CCR sections 2449, 2449.1, and 2449.2, in compliance with Government Code sections 11346.2, subdivision (a)(3), and 11346.8, subdivision (c), applies to construction contractors who own or operate within California any vehicles with a diesel-fueled or alternative diesel fueled off-road compression-ignition engine with maximum power (max hp) of 25 horsepower (hp) or greater provided that the vehicle cannot be registered and driven safely on-road or was not designed to be driven on-road, even if it has been modified so that it can be driven safely on-road.

Section 2449(i), in relevant part, provides:

(1) For a project involving the use of vehicles subject to this regulation, the prime contractor must obtain copies of the valid Certificate of Reported Compliance with the Regulation for In-Use Off-Road Diesel-Fueled Fleets for the fleet selected for the contract and their listed subcontractors, if applicable, prior to entering into a new or renewed contract with that fleet.

(2) No prime contractor or public works awarding body, as applicable, shall enter into a contract with a fleet for which it does not have a valid Certificate of Reported Compliance for the fleet and its listed subcontractors, if applicable, prior to entering into a new or renewed contract with that fleet.

(3) The Certificates of Reported Compliance received by the prime contractor for a project must be retained for three (3) years after that project's completion. Upon request by California Air Resources Board ("CARB"), these records must be provided to CARB within five (5) business days of the request.

(4) Situations in which prime contractors or public works awarding bodies, as applicable, are contracting for projects that are considered emergency operations, as defined in section 2449(c)(18), are exempt from the requirements in section 2449(i)(1)-(3), but must still retain records verifying vehicles subject to the regulation that are operating on the emergency operations project are actually being operated on the project for emergency operations only. These records must include a description of the emergency, the address or a description of the specific location of the emergency, the dates on which the emergency operations were performed, and an attestation by the fleet that the vehicles are operated on the project for emergency operations only.

Section 2449(j), in relevant part, also states:

(1) Between March 1 and June 1 of each year, a prime contractor must collect new valid Certificates of Reported Compliance for the current compliance year, as defined in section 2449(n), from all fleets that have an ongoing

contract with the prime contractor as of March 1 of that year. Prime contractors must not write contracts to evade this requirement.

(2) Prime contractors shall only allow fleets with valid Certificates of Reported Compliance on the prime contractor's job sites.

(3) If the prime contractor discovers that any fleet intending to operate vehicles subject to this regulation for the prime contractor does not have a valid Certificate of Reported Compliance, as defined in section 2449(n), or if the prime contractor observes any noncompliant vehicles subject to the regulation on the prime contractor's job site, then the prime contractor must report specified information regarding the fleet to CARB within five (5) business days of such discovery.

(4) Upon request by CARB, the prime contractor must immediately disclose to CARB the name and contact information of each responsible party for all vehicles subject to this regulation operating at the job site or for the prime contractor.

(5) The prime contractor shall prominently display signage for any project where vehicles subject to this regulation will operate for eight (8) calendar days or more. The signage must be posted by the eighth calendar day from which the first vehicle operates. The signage will be in lettering larger than size 14-point type and displayed in a conspicuous place where notices to employees are customarily posted at the job site or where there is employee foot traffic. If one of the above locations is also viewable by the public, it should be posted at that location. The signage must include specified information regarding idling regulations for In-Use Off-Road Diesel-Fueled Fleets with directions on how to report observed noncompliance of the provided regulations to CARB.

I am aware of the provisions of Title 13 CCR sections 2449, 2449.1, and 2449.2, which apply to every contractor who owns or operates off-road diesel fleet vehicles in California, and I will comply with such provisions, including providing Certificate(s) of Reported Compliance for In-Use Off-Road Diesel-Fueled Fleets for the fleet selected for the contract and their listed subcontractors, if applicable, with its bid.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

Bidder must attach valid Certificate(s) Reported Compliance with the Regulation for In-Use Off-Road Diesel-Fueled Fleets provided by CARB for the fleet selected for the contract and their listed subcontractors, if applicable, to this form.

END OF DOCUMENT

DOCUMENT 00 45 26

WORKERS' COMPENSATION CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Labor Code section 3700, in relevant part, 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 by one or more insurers duly authorized to write compensation insurance in this state; and/or
>
> b. By securing from the Director of Industrial Relations a certificate of consent to self-insure, 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 employees.

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

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

(In accordance with Labor Code sections 1860 and 1861, the above certificate must be signed and filed with the awarding body prior to performing any Work under this Contract.)

END OF DOCUMENT

DOCUMENT 00 45 46.01

PREVAILING WAGE AND RELATED LABOR REQUIREMENTS CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

I hereby certify that I will conform to the State of California Public Works Contract requirements regarding prevailing wages, benefits, on-site audits with 48-hours' notice, payroll records, and apprentice and trainee employment requirements, for all Work on the above Project including, without limitation, labor compliance monitoring and enforcement by the Department of Industrial Relations.

I hereby certify that, if this Project utilizes federal funds, I will also conform to the Federal Labor Standards Provisions regarding minimum wages, withholding, payrolls and basic records, apprentice and trainee employment requirements, equal employment opportunity requirements, Copeland Act requirements, Davis-Bacon and Related Act requirements, Contract Work Hours and Safety Standards Act requirements, and any and all other applicable requirements for federal funding for all Work on the above Project.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.02

DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

GENERAL INSTRUCTIONS

Section 17076.11 of the Education Code requires school districts using, or planning to use, funds allocated pursuant to the State of California School Facility Program ("Program") for the construction and/or modernization of school buildings to have a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%) per year of the overall dollar amount expended each year by the school district on projects that receive state funding. Therefore, the lowest responsive responsible Bidder awarded the Contract must submit this document to the District with its executed Agreement, identifying the steps contractor took to solicit DVBE participation in conjunction with this Contract. **Do not submit this form with your bids.**

PART I – Method of Compliance with DVBE Participation Goals. Check the appropriate box to indicate your method of committing the contract dollar amount.

YOUR BUSINESS ENTERPRISE IS:	**AND YOU WILL**	**AND YOU WILL**
A. ☐ Disabled veteran owned and your forces will perform at least 3% of this Contract	Include a copy of your DVBE letter from Office of Small Business and Disabled Veterans Business Enterprise Services ("OSDS")*	Complete Part 1 of this form and the Certification
B. ☐ Disabled veteran owned but is unable to perform 3% of this Contract with your forces	Use DVBE subcontractors /suppliers to bring the Contract participation to at least 3%	Include a copy of each DVBE's letter from OSDS (including yours, if applicable), and complete Part 1 of this form and the Certification
C. ☐ **NOT** disabled veteran owned	Use DVBE subcontractors /suppliers for at least 3% of this Contract	
D. ☐ Unable to meet the required participation goals after good faith efforts	Make good faith efforts, including contacts, advertisement and DVBE solicitation	Complete all of this form and the Certification

* A DVBE letter from OSDS is obtained from the participating DVBE.

You must complete the following table to show the dollar amount of DVBE participation:

	TOTAL CONTRACT PRICE
A. Prime Bidder, if DVBE (own participation)	$
B. DVBE Subcontractor or Supplier	
1.	
2.	
3.	
4.	
C. Subtotal (A & B)	
D. Non-DVBE	
E. Total Bid	

PART II – Contacts. To identify DVBE subcontractors/suppliers for participation in your contract, you must contact each of the following categories. You should contact several DVBE organizations.

CATEGORY	**TELEPHONE NUMBER**	**DATE CONTACTED**	**PERSON CONTACTED**
1. The District, if any			*
2. OSDS, provides assistance locating DVBEs at https://caleprocure.ca.gov/pages/PublicSearch/supplier-search.aspx	(916) 375-4940		*
3. DVBE Organization (List)			*

*Write "recorded message" in this column, if applicable.

PART III – Advertisement. You must advertise for DVBE participation in both a trade and focus paper. List the advertisement you place to solicit DVBE participation. Advertisements should be published at least fourteen (14) days prior to bid/proposal opening; if you cannot advertise fourteen (14) days prior, advertisements should be published as soon as possible. Advertisements must include that your firm is seeking DVBE participation, the project name and location, and your firm's name, your contact person, and telephone number. Attach copies of advertisements to this form.

FOCUS/TRADE PAPER NAME	**CHECK ONE**		**DATE OF ADVERTISEMENT**
	TRADE	**FOCUS**	

PART IV – DVBE Solicitations. List DVBE subcontractors/suppliers that were invited to bid. Use the following instructions to complete the remainder of this section (read the three columns as a sentence from left to right). If you need additional space to list DVBE solicitations, please use a separate page and attach to this form.

IF THE DVBE…..	**THEN…..**	**AND…..**
was selected to participate	Check "YES" in the "SELECTED" column	include a copy of their DVBE letter(s) from OSDS
was **NOT** selected to participate	Check "NO" in the "SELECTED" column	state why in the "REASON NOT SELECTED" column
did not respond to your solicitation	Check the "NO RESPONSE" column.	

DVBE CONTACTED	**SELECTED**		**REASON NOT SELECTED**	**NO RESPONSE**
	YES	**NO**		

A copy of this form must be retained by you and may be subject to a future audit.

CERTIFICATION

I, _____, certify that I am the bidder's _____ and that I have made a diligent effort to ascertain the facts with regard to the representations made herein. In making this certification, I am aware of section 12650 et seq. of the Government Code providing for the imposition of treble damages for making false claims.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.03

DRUG-FREE WORKPLACE CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This Drug-Free Workplace Certification form is required from the successful Bidder pursuant to Government Code section 8350 et seq., the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or service from any state agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract or grant awarded by a state agency may be subject to suspension of payments or termination of the contract or grant, and the contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

The District is not a "state agency" as defined in the applicable section(s) of the Government Code, but the District is a local agency and public school district under California law and requires all contractors on District projects to comply with the provisions and requirements of the Drug-Free Workplace Act of 1990.

Contractor must also comply with the provisions of Health & Safety Code section 11362.3 which prohibits the consumption or possession of cannabis or cannabis products in any public place, including school grounds, and specifically on school grounds while children are present.

Contractor shall certify that it will provide a drug-free workplace 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 the person's or organization's workplace and specifying actions which will be taken against employees for violations 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) The person's or organization's policy of maintaining a drug-free workplace.

   (3) The availability of drug counseling, rehabilitation, and employee-assistance programs.

   (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 or grant be given a copy of the statement required above, and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of Government Code section 8355 listed above and will publish a statement notifying employees concerning (a) the prohibition of controlled substance at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by section 8355(a), and requiring that the employee agree to abide by the terms of that statement.

I also understand that if the District determines that I have either (a) made a false certification herein, or (b) violated this certification by failing to carry out the requirements of section 8355, that the Contract awarded herein is subject to termination, suspension of payments, or both. I further understand that, should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of the aforementioned Act.

I acknowledge that I am aware of the provisions of and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990 and Health and Safety Code section 11362.3.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.04

TOBACCO-FREE ENVIRONMENT CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This Tobacco-Free Environment Certification form is required from the successful Bidder.

Pursuant to, without limitation, 20 U.S.C. section 6083, Labor Code section 6400 et seq., Health & Safety Code section 104350 et seq., Business and Professions Code section 22950 et seq., and District Board policies (if applicable), all District sites, including the Project site, are tobacco-free environments. Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. The prohibition on smoking includes the use of any electronic smoking device that creates an aerosol or vapor, in any manner or in any form, and the use of any oral smoking device for the purpose of circumventing the prohibition of tobacco smoking. Further, Health & Safety Code section 11362.3 prohibits the smoking or use of cannabis or cannabis products in any place where smoking tobacco is prohibited.

I acknowledge that I am aware of the District's policy regarding tobacco-free environments at District sites, including the Project site and hereby certify that I will adhere to the requirements of that policy and not permit any of my firm's employees, agents, subcontractors, or my firm's subcontractors' employees or agents, to use tobacco and/or smoke on the Project site.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.05

HAZARDOUS MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

1. Contractor hereby certifies that no asbestos, or asbestos-containing materials, polychlorinated biphenyl (PCB), or any material listed by the federal or state Environmental Protection Agency or federal or state health agencies as a hazardous material, or any other material defined as being hazardous under federal or state laws, rules, or regulations, ("New Hazardous Material"), shall be furnished, installed, or incorporated in any way into the Project or in any tools, devices, clothing, or equipment used to affect any portion of Contractor's work on the Project for District.

2. Contractor further certifies that it has instructed its employees with respect to the above-mentioned standards, hazards, risks, and liabilities.

3. Asbestos and/or asbestos-containing material shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite. Any or all material containing greater than one-tenth of one percent (0.1%) asbestos shall be defined as asbestos-containing material.

4. Any disputes involving the question of whether or not material is New Hazardous Material shall be settled by electron microscopy or other appropriate and recognized testing procedure, at the District's determination. The costs of any such tests shall be paid by Contractor if the material is found to be New Hazardous Material.

5. All Work or materials found to be New Hazardous Material or Work or material installed with equipment containing New Hazardous Material will be immediately rejected and this Work will be removed at Contractor's expense at no additional cost to the District.

6. Contractor has read and understood the document titled, "Hazardous Materials Procedures & Requirements" and shall comply with all the provisions outlined therein.

7. Contractor certifies that it is knowledgeable of, and shall comply with, all laws applicable to the Work including, but not limited to, all federal, state, and local laws, statutes, standards, rules, regulations, and ordinances applicable to the Work.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.06

LEAD-BASED MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This certification provides notice to the Contractor that:

(1) Contractor's work may disturb lead-containing building materials.

(2) Contractor shall notify the District if any work may result in the disturbance of lead-containing building materials.

(3) Contractor shall comply with the Renovation, Repair and Painting Rule, if lead-based paint is disturbed in a six-square-foot or greater area indoors or a 20-square-foot or greater area outdoors.

1. Lead as a Health Hazard

Lead poisoning is recognized as a serious environmental health hazard facing children today. Even at low levels of exposure, much lower than previously believed, lead can impair the development of a child's central nervous system, causing learning disabilities, and leading to serious behavioral problems. Lead enters the environment as tiny lead particles and lead dust disburses when paint chips, chalks, peels, wears away over time, or is otherwise disturbed. Ingestion of lead dust is the most common pathway of childhood poisoning; lead dust gets on a child's hands and toys and then into a child's mouth through common hand-to-mouth activity. Exposures may result from construction or remodeling activities that disturb lead paint, from ordinary wear and tear of windows and doors, or from friction on other surfaces.

Ordinary construction and renovation or repainting activities carried out without lead-safe work practices can disturb lead-based paint and create significant hazards. Improper removal practices, such as dry scraping, sanding, or water blasting painted surfaces, are likely to generate high volumes of lead dust.

Because the Contractor and its employees will be providing services for the District, and because the Contractor's work may disturb lead-containing building materials, CONTRACTOR IS HEREBY NOTIFIED of the potential presence of lead-containing materials located within certain buildings utilized by the District. All school buildings built prior to 1978 are presumed to contain some lead-based paint until sampling proves otherwise.

8. Overview of California Law

Education Code section 32240 et seq. is known as the Lead-Safe Schools Protection Act. Under this act, the Department of Health Services is to conduct a sample survey of schools in the State of California for the purpose of developing risk factors to predict lead contamination in public schools. (Ed. Code, § 32241.)

Any school that undertakes any action to abate existing risk factors for lead is required to utilize trained and state-certified contractors, inspectors, and workers.

(Ed. Code, § 32243, subd. (b).) Moreover, lead-based paint, lead plumbing, and solders, or other potential sources of lead contamination, shall not be utilized in the construction of any new school facility or the modernization or renovation of any existing school facility. (Ed. Code, § 32244.)

Both the Federal Occupational Safety and Health Administration ("Fed/OSHA") and the California Division of Occupational Safety and Health ("Cal/OSHA") have implemented safety orders applicable to all construction work where a contractor's employee may be occupationally exposed to lead.

The OSHA Regulations apply to all construction work where a contractor's employee may be occupationally exposed to lead. The OSHA Regulations contain specific and detailed requirements imposed on contractors subject to those regulations. The OSHA Regulations define construction work as work for construction, alteration, and/or repair, including painting and decorating. Regulated work includes, but is not limited to, the following:

a. Demolition or salvage of structures where lead or materials containing lead are present;

b. Removal or encapsulation of materials containing lead;

c. New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;

d. Installation of products containing lead;

e. Lead contamination/emergency cleanup;

f. Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed; and

g. Maintenance operations associated with the construction activities described in the subsection.

Because it is assumed by the District that all painted surfaces (interior as well as exterior) within the District contain some level of lead, it is imperative that the Contractor, its workers and subcontractors fully and adequately comply with all applicable laws, rules and regulations governing lead-based materials (including title 8, California Code of Regulations, section 1532.1).

Contractor shall notify the District if any Work may result in the disturbance of lead-containing building materials. Any and all Work that may result in the disturbance of lead-containing building materials shall be coordinated through the District. A signed copy of this Certification shall be on file prior to beginning Work on the Project, along with all current insurance certificates.

1. Renovation, Repair and Painting Rule, Section 402(c)(3) of the Toxic Substances Control Act

   The EPA requires lead safe work practices to reduce exposure to lead hazards created by renovation, repair and painting activities that disturb lead-based paint. Pursuant to the Renovation, Repair and Painting Rule (RRP), renovations in homes, childcare facilities, and schools built prior to 1978 must be conducted by certified renovations firms, using renovators with training by a EPA-accredited training provider, and fully and adequately complying with all applicable laws, rules and regulations governing lead-based materials, including those rules and regulations appearing within title 40 of the Code of Federal Regulations as part 745 (40 CFR 745).

   The RRP requirements apply to all contractors who disturb lead-based paint in a six-square-foot or greater area indoors or a 20-square-foot or greater area outdoors. If a DPH-certified inspector or risk assessor determines that a home constructed before 1978 is lead-free, the federal certification is not required for anyone working on that particular building.

2. Contractor's Liability

   If the Contractor fails to comply with any applicable laws, rules, or regulations, and that failure results in a site or worker contamination, the Contractor will be held solely responsible for all costs involved in any required corrective actions, and shall defend, indemnify, and hold harmless the District, pursuant to the indemnification provisions of the Contract, for all damages and other claims arising therefrom.

   If lead disturbance is anticipated in the Work, only persons with appropriate accreditation, registrations, licenses, and training shall conduct this Work.

   It shall be the responsibility of the Contractor to properly dispose of any and all waste products, including, but not limited to, paint chips, any collected residue, or any other visual material that may occur from the prepping of any painted surface. It will be the responsibility of the Contractor to provide the proper disposal of any hazardous waste by a certified hazardous waste hauler. This company shall be registered with the Department of Transportation (DOT) and shall be able to issue a current manifest number upon transporting any hazardous material from any school site within the District.

   The Contractor shall provide the District with any sample results prior to beginning Work, during the Work, and after the completion of the Work. The District may request to examine, prior to the commencement of the Work, the lead training records of each employee of the Contractor.

THE CONTRACTOR HEREBY ACKNOWLEDGES, UNDER PENALTY OF PERJURY, THAT IT:

1. HAS RECEIVED NOTIFICATION OF POTENTIAL LEAD-BASED MATERIALS ON THE OWNER'S PROPERTY;

2. IS KNOWLEDGEABLE REGARDING AND WILL COMPLY WITH ALL APPLICABLE LAWS, RULES, AND REGULATIONS GOVERNING WORK WITH, AND DISPOSAL, OF LEAD.

THE UNDERSIGNED WARRANTS THAT HE/SHE HAS THE AUTHORITY TO SIGN ON BEHALF OF AND BIND THE CONTRACTOR. THE DISTRICT MAY REQUIRE PROOF OF SUCH AUTHORITY.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.07

IMPORTED MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This form shall be executed by all entities that, in any way, provide or deliver and/or supply any soils, aggregate, or related materials ("Fill") to the Project Site and shall be provided to the District at least ten (10) days before delivery. All Fill shall satisfy all requirements of any environmental review of the Project performed pursuant to the statutes and guidelines of the California Environmental Quality Act, section 21000 et seq. of the Public Resources Code ("CEQA"), and all requirements of section 17210 et seq. of the Education Code, including requirements for a Phase I environmental assessment acceptable to the State of California Department of Education and Department of Toxic Substances Control.

Certification of:
- □ Delivery Firm/Transporter
- □ Supplier
- □ Manufacturer
- □ Wholesaler
- □ Broker
- □ Retailer
- □ Distributor
- □ Other _____

Type of Entity
- □ Corporation
- □ General Partnership
- □ Limited Partnership
- □ Limited Liability Company
- □ Sole Proprietorship
- □ Other _____

Name of firm ("Firm"): _____

Mailing address: _____

Addresses of branch office used for this Project: _____

If subsidiary, name and address of parent company: _____

_____

By my signature below, I hereby certify that I am aware of section 25260 of the Health and Safety Code and the sections referenced therein regarding the definition of hazardous material. I further certify on behalf of the Firm that all soils, aggregates, or related materials provided, delivered, and/or supplied or that will be provided, delivered, and/or supplied by this Firm to the Project Site are free of any and all hazardous material as defined in section 25260 of the Health and Safety Code. I further certify that I am authorized to make this certification on behalf of the Firm.

Date: _____

Proper Name of Firm: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.08

CRIMINAL BACKGROUND INVESTIGATION/FINGERPRINTING CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

The undersigned does hereby certify to the District that I am a representative of the Contractor currently under contract with the District; that I am familiar with the facts herein certified; and that I am authorized and qualified to execute this certificate on behalf of Contractor.

Contractor certifies that it has taken at least one of the following actions (check all that apply):

☐ Pursuant to Education Code section 45125.2(a), Contractor has installed or will install, prior to commencement of Work, a physical barrier at the Work Site, that will limit contact between Contractor's employees, Subcontractors or suppliers and District pupils at all times; and/or

☐ Pursuant to Education Code section 45125.2(a), 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 ("DOJ") has ascertained, or as described below, will ascertain, has not been convicted of a violent or serious felony. The name and title of the employee who will be supervising Contractor's and its subcontractors' or suppliers' employees is:

Name: _____

Title: _____

NOTE: If Contractor is a sole proprietor, and elects the above option, Contractor must have the above-named employee's fingerprints prepared and submitted by District for submission to the DOJ, in accordance with Education Code section 45125.1(h). No work shall commence until such determination by DOJ has been made.

☐ Pursuant to Education Code section 45125.2(a), the District will take appropriate steps to protect the safety of any pupils that may come in contact with Contractor's employees, subcontractors or suppliers so that the fingerprinting and criminal background investigation requirements of Education Code section 45125.2 shall not apply to Contractor under the Contract.

☐ The Work on the Contract is either (i) at an unoccupied school site and no employee of Contractor and/or subcontractor or supplier of any tier of the Contract shall come in contact with the District pupils or (ii) if Contractor's employees or any subcontractor or supplier of any tier of the Contract interacts with pupils, such interaction shall only take place under the immediate supervision and control of the pupil's parent or guardian or a school employee, so that the fingerprinting and criminal background investigation requirements of Education Code section 45125.1 shall not apply to Contractor under the Contract.

☐ The Contractor, who is not a sole proprietor, has complied with the fingerprinting requirements of Education Code section 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 DOJ has determined (A) that none of those employees has been convicted of a felony, as that term is defined in Education Code section 45122.1 and/or (B) that the prohibition does not apply to an employee as provided by Education Code section 45125.1(e)(2) or (3). When the Contractor performs the criminal background check, it shall immediately provide any subsequent arrest and conviction information it receives to the District pursuant to the subsequent arrest service. No work shall commence until the Department of Justice ascertains that Contractor's employees and any subcontractors' employees have not been convicted of a felony as defined in Education Code Section 45122.1.

A complete and accurate list of Contractor's employees and of all of its subcontractors' employees who may come in contact with District pupils during the course and scope of the Contract is attached hereto as ATTACHMENT "A;" and/or

☐ The Contractor is a sole proprietor and intends to comply with the fingerprinting requirements of Education Code section 45125.1(h) with respect to all Contractor's employees who may have contact with District pupils in the course of providing services pursuant to the Contract, and hereby agrees to the District's preparation and submission of fingerprints such that the DOJ may determine (A) that none of those employees has been convicted of a felony, as that term is defined in Education Code section 45122.1 and/or (B) that the prohibition does not apply to an employee as provided by Education Code section 45125.1(e)(2) or (3). No work shall commence until the Department of Justice ascertains that Contractor's employees and any subcontractors' employees have not been convicted of a felony as defined in Education Code Section 45122.1.

Contractor's responsibility for background clearance extends to all of its employees, Subcontractors or suppliers, and employees of Subcontractors or suppliers 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: _____

Print Name: _____

Title: _____

[CONTINUED ON NEXT PAGE]

ATTACHMENT "A"

List of Employees/Subcontractors

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

If further space is required for the list of employees/subcontractors, attach additional copies of this page.

END OF DOCUMENT

DOCUMENT 00 45 46.09

DRUG AND ALCOHOL-FREE SCHOOLS CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Pursuant to, without limitation, District Board policies, all District sites, including the Project site, are drug and alcohol-free schools. Possession, use, or dale of drugs and alcohol is prohibited at any time in district-owned or leased buildings, on district property, and in district vehicles unless otherwise permitted by law.

I acknowledge that I am aware of the District's policy regarding drug and alcohol-free schools, including the Project site and hereby certify that I will adhere to the requirements of that policy and not permit any of my firm's employees, agents, subcontractors, or my firm's subcontractors' employees or agents, to possess, use or sell:

1. Any substance which may not lawfully be possessed, used, or sold in California.

2. Cannabis or cannabis products (Health and Safety Code, § 11362.3; 21 USC §§ 812, 844).

3. Alcohol beverages, unless approved by the Superintendent or designee for limited purposes specified in Business and Professions Code section 25608.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.10

ROOFING PROJECT CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Pursuant to Public Contract Code section 3000, et seq. this form shall be executed by all contractors, materials manufacturers, or vendors involved in a bid or proposal for the repair or replacement of a roof of a public school building where the project is either for repair of more than 25% of the roof or that has a total cost more than $21,000 ("roofing project") and submitted to the District when the award is made.

Certification of: □ Contractor □ Materials Manufacturer
□ Vendor □ Other _____

I, _____, _____, certify that I have not
[Name] [Name of Firm]
offered, given, or agreed to give, received, accepted, or agreed to accept, any gift, contribution, or any financial incentive whatsoever to or from any person in connection with the roofing project contract. As used in this certification, "person" means any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Furthermore, I, _____, _____, certify that
[Name] [Name of Firm]
I do not have, and throughout the duration of the contract, I will not have, any financial relationship in connection with the performance of this contract with any architect, engineer, roofing consultant, materials manufacturer, distributor, or vendor that is not disclosed below.

I, _____, _____, have the following
[Name] [Name of Firm]
financial relationships with an architect, engineer, roofing consultant, materials manufacturer, distributor, or vendor, or other person in connection with the following roofing project contract (provide Name and Address of Building, and Contract Date and Number):

_____

_____

_____

_____

_____

_____

_____

By my signature below, I hereby certify that, to the best of my knowledge, the contents of this disclosure are true, or are believed to be true. I further certify on behalf of the Firm that I am aware of section 3000 et seq. of the California Public Contract Code, and the sections referenced therein regarding the penalties for providing false information or failing to disclose a financial relationship in this disclosure. I further certify that I am authorized to make this certification on behalf of the Firm.

Date: _____

Proper Name of Firm: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.11

FEDERAL DEBARMENT CERTIFICATION

PROJECT/CONTRACT NO.: **Project Name Project No.** between the Lodi Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

1. Bidder certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or Board;

b. Have not within a three-year period preceding this bid been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

d. Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where Bidder is unable to certify to any of the statements in this certification, Bidder shall attach an explanation to this certification.

3. Bidder agrees to include the following certification in all subcontracts, for all lower tiers:

"Debarment and Suspension Certification – By submission of its proposal, the contractor (or vendor, or consultant, depending on the transaction) certifies to the best of its knowledge and belief that it and its principals are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency in accordance with 2 CFR 200.213 and 2 CFR 180."

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.12

BYRD ANTI-LOBBYING CERTIFICATION

(For federally funded contracts exceeding $100,000)

Applicable to Grants, Subgrants, Cooperative Agreements, and Contracts Exceeding $100,000 in Federal Funds

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

The undersigned certifies, to the best of their knowledge and belief, that:

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

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

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

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

_____

Contractor

_____

Address

_____

Certified by: (type or print)

_____

Title

_____

Signature

_____

Date

Disclosure of Lobbying Activities Approved by OMB 0348-004

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352
(See following page for public burden disclosure)

1. Type of Federal Action: ☐ contract ☐ grant ☐ cooperative agreement loan ☐ loan guarantee ☐ loan insurance	**2. Status of Federal Action:** ☐ proposal/offer/application ☐ initial award ☐ post-award	**3. Report Type:** ☐ initial filing ☐ material change For material change only: **Year_____quarter _____** **Date of last report_____**

4. Name and Address of Reporting Entity: **_____Prime _____Subawardee** **Tier_____, if Known:** **Congressional District**, *if known*:	**5. If Reporting Entity in No. 4 is Subawardee,** Enter Name and Address of Prime: **Congressional District**, if known:
6. Federal Department/Agency:	**7. Federal Program Name/Description:** CFDA Number, *if applicable*: _____
8. Federal Action Number, *if known:*	**9. Award Amount,** *if known:* $
10a. Name and Address of Lobbying Registrant *(if individual, last name, first name, MI):*	**10b. Individuals Performing** Services *(including address if different from No. 10a)* *(last name, first name, MI):*
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.	**Signature: _____** **Print Name: _____** **Title: _____** **Telephone No.: _____ Date: ____**
Federal Use Only	**Authorized for Local Reproduction** **Standard Form - LLL (Rev. 7-97)**

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

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

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a follow up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitations for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Included prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.
    (b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).

11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB control Number. The valid OMB control number for this

information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

END OF DOCUMENT

DOCUMENT 00 45 49

REGISTERED SUBCONTRACTORS LIST

(Labor Code Section 1771.1)

(Not required for construction projects less than $25,000 or maintenance projects less than $15,000)

PROJECT: **Project Name Project No.**

Date Submitted (for Updates): _____

Contractor acknowledges and agrees that it must clearly set forth below the name and Department of Industrial Relations (DIR) registration number of each subcontractor **for all tiers** who will perform work or labor or render service to Contractor or its subcontractors in or about the construction of the Work **at least two (2) weeks before the subcontractor is scheduled to perform work**. This document is to be updated as all tiers of subcontractors are identified.

Contractor acknowledges and agrees that, if Contractor fails to list as to any subcontractor of any tier who performs any portion of Work, the Contract is subject to cancellation and the Contractor will be subjected to penalty under applicable law.

If further space is required for the list of proposed subcontractors, attach additional copies of page 2 showing the required information, as indicated below.

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

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Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Date: _____

Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 90
POST BID INTERVIEW

PART 1 – GENERAL

1.01 SUMMARY

If requested by the District, this Section requires the apparent low bidder to attend and participate in a Post Bid Interview with the Construction Manager, prior to award of any contract by the District. The Post Bid Interview will be scheduled by the Construction Manager within three (3) calendar days after the date of bid.

1.02 REQUIRED ATTENDANCE

A. A duly authorized representative of the apparent low bidder is required to attend the Post Bid Interview, in person.

B. The apparent low bidder's authorized representative(s) must have (1) knowledge of how the bid submitted was prepared, (2) the person responsible for supervising performance of the Work, and (3) the authority to bind the apparent low bidder.

C. Failure to attend the Post Bid Interview as scheduled will be considered just cause for the District to reject the Bid as nonresponsive.

1.03 POST BID INTERVIEW PROCEDURE

A. The Construction Manager will review the Bid with the attendees.

B. The Construction Manager will review the Contract Documents with the attendees, including but not limited to:

(1) Insurance
(2) Bonding
(3) Addenda
(4) Pre-Bid Clarifications
(5) Scope of Work
(6) Bid Packages Descriptions
(7) Bid Alternates
(8) Contract Plans
(9) Contract Specifications
(10) Project Schedule and Schedule Requirements
(11) Critical Dates Requirement for Other Bid Packages
(12) Prevailing Wage Requirements
(13) Liquidated Damages
(14) Required Documentation for Contract Administration
(15) Contract Coordination Requirements

1.04 POST BID INTERVIEW DOCUMENTATION

The Construction Manager will document the Post Bid Interview on the form attached to this Section. Both the apparent low bidder and the Construction Manager are required to sign the Post Bid Interview Documentation.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

POST BID INTERVIEW

CONSTRUCTION MANAGER

[Name]
[Address 1]
[Address 2]
[Phone] [Fax]

BIDDER: _____

DATE: _____ TIME: _____PHONE: _____

I. INTRODUCTIONS:

A. Present

_____
CONTRACTOR CONTRACTOR

_____

_____
[CM] [CM]

II. PROPOSED CONTRACT:

III. PURPOSE OF INTERVIEW IS TO ASSURE A MUTUAL UNDERSTANDING OF THE FOLLOWING:

A. Do you acknowledge submission of a complete and accurate bid? Yes No

B. Do you acknowledge the Bid Document submittal timelines after NOA and NTP and can you meet those timelines? Yes No

C. Do you acknowledge the requirements for the escrow of bid documents? Yes No

D. Are you comfortable with your listed subcontractors? Yes No

IV. CONTRACTUAL REQUIREMENTS:

A. Do you understand you are a prime contractor? Yes No

B. Can you meet specified insurance requirements? Yes No

1. Do any of your policies that require Additional Insured endorsements exceed the minimum coverage requirements? Yes No

2. Are you requesting that the District accept an Excess Liability Insurance Policy to meet the policy limit? Yes No

3. Will there be a gap between the per occurrence amount of any underlying policy and the start of the coverage under the Umbrella or Excess Liability Insurance Policy? Yes No

C. Will you provide the Performance Bond and Labor and Material Bond for 100% of the Contract Price as stipulated? Yes No

1. Cost for bonds: _____% Yes No

2. Is the cost of your bonds in your base bid? Yes No

3. Is your surety licensed to issue bonds in California? Yes No

D. Do you understand the fingerprinting requirements? Yes No

E. Is it understood that all workers must be paid prevailing wage? Yes No

F. Is it understood that all subcontractors of every tier must be registered as a public works contractor with the Department of Industrial Relations? Yes No

V. SCOPE OF WORK:

A. Acknowledged Receipt of Addenda #1-_____ Yes No

B. Are the costs for addenda items included in your bid? (if applicable) Yes No

C. Do you have a complete understanding of your Scope of Work under the proposed Agreement? Yes No

D. You have re-reviewed the documents and understand the Scope of the Work. Are there any items that require clarification? Yes No

If yes, please identify them.

1. _____

_____

2. _____

_____

3. _____

Is (are) there additional cost(s) for the above item(s)? Yes No

E. Is the cost for owner-controlled contingency included in your bid? Yes No

F. Have you reviewed bid alternative(s) #1-_____? (if applicable) Yes No

G. Are the costs for bid alternatives included in your bid? Yes No

H. Are the plans and specifications clear and understandable to your satisfaction? Yes No

I. Do you acknowledge that the time to submit notice of requests for substitution of specified materials has expired? Yes No

VI. SCHEDULE:

A. Do you acknowledge and agree to the stipulated completion dates and milestones in the contract? Yes No

1. Will you provide a detailed construction schedule to _____ within the required ten (10) days of the Notice to Proceed, per the contract? Yes No
2. Can you meet the submittal deadline? Yes No
3. It is understood that the Project schedule is critical and that that weekend and overtime work may be required to meet the milestones. Yes No
4. It is understood that if rain does occur, then all dewatering and protection of work is required, per the contract. If not, what do you believe must change and why? Yes No

_____

_____

_____

B. Identify critical materials, deliveries, long lead items and other dependencies, including Owner Furnished items that could affect the completion of your work. Yes No

1. _____
2. _____
3. _____
4. _____
5. _____

C. Do you understand that there is going to be maintenance and other construction taking place on site during the course of the project? Yes No

VII. EXECUTION OF WORK

A. Do you understand the access to the site? Yes No

B. Do you understand the staging area restrictions? Yes No

C. Have you included protection of [asphalt, floors, and roofs]? Yes No

D. Do you understand that the site is occupied by students, teachers, administrators, parents, etc.?

VIII. CONTRACTOR COMMENTS/SUGGESTIONS:

1. _____
2. _____
3. _____
4. _____
5. _____

IX. CONTRACTOR

You agree the information contained herein is part of your contractual obligations. Your signature acknowledges your agreement to perform all Work in the Contract Documents, and that costs for all Work are included in your bid.

The foregoing information is true and accurate, and I am authorized to sign as an officer of the company I am representing.

[Company Name]

Signature _____ Title: _____

Date: _____

X. CONSTRUCTION MANAGER

Signature _____ Title: _____

Date: _____

Title of Document: POST BID INTERVIEW
Number of Pages: _____
Date of Document: _____

END OF DOCUMENT

DOCUMENT 00 51 00
NOTICE OF AWARD

Dated: _____ 20__

To: _____ (Contractor)

_____
(Address)

From: Governing Board ("Board") of the Lodi Unified School District ("District")

Re: _____, Project No. _____ ("Project").

Contractor has been awarded the Contract for the above-referenced Project on _____ _____, 20__, by action of the District's Board.

The Contract Price is _____ Dollars ($_____), and includes alternates _____.

Three (3) copies of each of the Contract Documents (except Drawings) accompany this Notice of Award. Three (3) sets of the Drawings will be delivered separately or otherwise made available. Additional copies are available at cost of reproduction.

You must comply with the following conditions precedent within **SEVEN (7)** calendar days of the date of this Notice of Award.

The Contractor shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7th)** calendar day following the date of the Notice of Award.

a. Agreement: To be executed by successful Bidder. Submit three (3) copies, each bearing an original signature.

b. Escrow of Bid Documentation: This must include all required documentation. See the document titled Escrow Bid Documentation for more information.

c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

d. Payment Bond (Contractor's Labor & Material Bond) (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

e. Insurance Certificates and Endorsements as required.

f. Workers' Compensation Certification.

g. Prevailing Wage and Related Labor Requirements Certification.

h. Disabled Veteran Business Enterprise Participation Certification. ***(If Applicable)***

i. Drug-Free Workplace Certification. ***(If Applicable)***

j. Tobacco-Free Environment Certification. ***(If Applicable)***

k. Hazardous Materials Certification. ***(If Applicable)***

l. Lead-Based Materials Certification. ***(If Applicable)***

m. Imported Materials Certification. ***(If Applicable)***

n. Criminal Background Investigation/Fingerprinting Certification.

o. Roofing Project Certification: from Contractor, Material Manufacturer and/or Vendor. ***(If Applicable)***

Failure to comply with these conditions within the time specified will entitle District to consider your bid abandoned, to annul this Notice of Award, and to declare your Bid Security forfeited, as well as any other rights the District may have against the Contractor.

After you comply with those conditions, District will return to you one fully signed counterpart of the Agreement.

LODI UNIFIED SCHOOL DISTRICT

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

DOCUMENT 00 52 13
AGREEMENT

THIS AGREEMENT IS MADE AND ENTERED INTO THIS _____ DAY OF _____ _____, 20___, by and between the Lodi Unified School District ("District") and _____ _____ ("Contractor") ("Agreement").

WITNESSETH: That the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree with each other, as follows:

3. **The Work**: Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor, and material necessary to perform and complete in a good and workmanlike manner, the work of the following project:

   Project Name Project No.

   ("Project" or "Contract" or "Work")

   It is understood and agreed that the Work shall be performed and completed as required in the Contract Documents including, without limitation, the Drawings and Specifications and submission of all documents required to secure funding or by the Division of the State Architect for close-out of the Project, under the direction and supervision of, and subject to the approval of, the District or its authorized representative.

4. **The Contract Documents**: The complete Contract consists of all Contract Documents as defined in the General Conditions and incorporated herein by this reference. Any and all obligations of the District and Contractor are fully set forth and described in the Contract Documents. All Contract Documents are intended to cooperate so that any Work called for in one and not mentioned in the other or vice versa is to be executed the same as if mentioned in all Contract Documents.

5. **Interpretation of Contract Documents**: Should any question arise concerning the intent or meaning of Contract Documents, including the Drawings or Specifications, the question shall be submitted to the District for interpretation. If a conflict exists in the Contract Documents, valid, written modifications, beginning with the most recent, shall control over this Agreement (if any), which shall control over the Special Conditions, which shall control over any Supplemental Conditions, which shall control over the General Conditions, which shall control over the remaining Division 0 documents, which shall control over Division 1 Documents which shall control over Division 2 through Division 49 documents, which shall control over figured dimensions, which shall control over large-scale drawings, which shall control over small-scale drawings. In the case of a discrepancy or ambiguity solely between and among the Drawings and Specifications, the discrepancy or ambiguity shall be resolved in favor of the interpretation that will provide District with the functionally complete and operable Project described in the Drawings and Specifications. In no case shall a document calling for lower quality and/or quantity material or workmanship control. The decision of the District in the matter shall be final.

6. **Time for Completion**: It is hereby understood and agreed that the Work under this Contract shall be completed within (__) consecutive calendar days ("Contract Time") from the date specified in the District's Notice to Proceed.

7. **Completion - Extension of Time**: Should the Contractor fail to complete this Contract, and the Work provided herein, within the time fixed for completion, due allowance being made for the contingencies provided for herein, the Contractor shall become liable to the District for all loss and damage that the District may suffer on account thereof. The Contractor shall coordinate its Work with the Work of all other contractors. The District shall not be liable for delays resulting from Contractor's failure to coordinate its Work with other contractors in a manner that will allow timely completion of Contractor's Work. Contractor shall be liable for delays to other contractors caused by Contractor's failure to coordinate its Work with the Work of other contractors.

8. **Liquidated Damages**: Time is of the essence for all work under this Agreement. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that the District will sustain in the event of and by reason of Contractor's delay; therefore, Contractor agrees that it shall pay to the District the sum of Five Hundred Dollars ($500) per day as liquidated damages for each and every day's delay beyond the time herein prescribed in completion of the Work.

   It is hereby understood and agreed that this amount is not a penalty.

   In the event that any portion of the liquidated damages is not paid to the District, the District may deduct that amount from any money due or that may become due the Contractor under this Agreement, and such deduction does not constitute a withholding or penalty. The District's right to assess liquidated damages is as indicated herein and in the General Conditions.

   The time during which the Contract is delayed for cause, as hereinafter specified, may extend the time of completion for a reasonable time as the District may grant, provided that Contractor has complied with the claims procedure of the Contract Documents. This provision does not exclude the recovery of damages by either party under other provisions in the Contract Documents.

9. **Loss Or Damage**: The District and its agents and authorized representatives shall not in any way or manner be answerable or suffer loss, damage, expense, or liability for any loss or damage that may happen to the Work, or any part thereof, or in or about the same during its construction and before acceptance, and the Contractor shall assume all liabilities of every kind or nature arising from the Work, either by accident, negligence, theft, vandalism, or any cause whatsoever; and shall hold the District and its agents and authorized representatives harmless from all liability of every kind and nature arising from accident, negligence, or any cause whatsoever.

10. **Limitation Of District Liability:** District's financial obligations under this Contract shall be limited to the payment of the compensation provided in this Contract. Notwithstanding any other provision of this Contract, in no event shall District be liable, regardless of whether any claim is based on contract or tort, for any special, consequential, indirect or incidental damages, including, but not limited to, lost profits or revenue, lost bonding capacity, arising out of or in connection with this Contract for the services performed in connection with this Contract.

11. **Insurance and Bonds**: Prior to issuance of the Notice to Proceed by the District, Contractor shall provide all required certificates of insurance, insurance endorsements, and payment and performance bonds as evidence thereof.

For projects where the District implements an Owner-Controlled or Wrap-Up Insurance Program (OCIP), the Contractor and all Subcontractors under the Contractor are required to participate in and comply with the OCIP. In such instances, prior to the issuance of the Notice to Proceed by the District, the Contractor shall submit all necessary certificates of insurance and insurance endorsements, except for those coverages provided by the OCIP as detailed in the OCIP Manual. The requirement to provide payment and performance bonds remains applicable.

12. **Prosecution of Work**: If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this Contract, the District, may, pursuant to the General Conditions and without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

13. **Authority of Architect, Project Inspector, and DSA**: Contractor hereby acknowledges that the Architect(s), the Project Inspector(s), and the Division of the State Architect ("DSA") have authority to approve and/or suspend Work if the Contractor's Work does not comply with the requirements of the Contract Documents, Title 24 of the California Code of Regulations, and all applicable laws and regulations. The Contractor shall be liable for any delay caused by its non-compliant Work.

14. **Assignment of Contract**: Neither the Contract, nor any part thereof, nor any moneys due or to become due thereunder, may be assigned by the Contractor without the prior written approval of the District, nor without the written consent of the Surety on the Contractor's Performance Bond (the "Surety"), unless the Surety has waived in writing its right to notice of assignment.

15. **Classification of Contractor's License**: Contractor hereby acknowledges that it currently holds valid Type "A, B, and/or C- " Contractor's license(s) issued by the State of California, Contractors' State License Board, in accordance with division 3, chapter 9, of the Business and Professions Code and in the classification called for in the Contract Documents.

16. **Registration as Public Works Contractor**: The Contractor and all Subcontractors currently are registered as public works contractors with the Department of Industrial Relations, State of California, in accordance with Labor Code section 1771.1.

17. **Payment of Prevailing Wages**: The Contractor and all Subcontractors shall pay all workers on all Work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code.

    For Projects Utilizing Federal Funds: In addition to the above, the Contractor and all Subcontractors must comply with the Davis-Bacon Act, applicable reporting requirements, and any other relevant federal funding requirements. In instances where a conflict arises between state and federal wage provisions, the more

stringent requirement shall prevail. This additional compliance is required only for projects that utilize federal funds.

18. **Labor Compliance Monitoring and Enforcement**: This Project is subject to labor compliance monitoring and enforcement by the Department of Industrial Relations pursuant to Labor Code section 1771.4 and Title 8 of the California Code of Regulations. Contractor specifically acknowledges and understands that it shall perform the Work of this Agreement while complying with all the applicable provisions of Division 2, Part 7, Chapter 1, of the Labor Code, including, without limitation, the requirement that the Contractor and all of its Subcontractors shall timely submit complete and accurate electronic certified payroll records as required by the Contract Documents, or the District may not issue payment.

19. **Contract Price**: In consideration of the foregoing covenants, promises, and agreements on the part of the Contractor, and the strict and literal fulfillment of each and every covenant, promise, and agreement, and as compensation agreed upon for the Work and construction, erection, and completion as aforesaid, the District covenants, promises, and agrees that it will well and truly pay and cause to be paid to the Contractor in full, and as the full Contract Price and compensation for construction, erection, and completion of the Work hereinabove agreed to be performed by the Contractor, the following price:

_____ Dollars

($_____),

in lawful money of the United States, which sum is to be paid according to the schedule provided by the Contractor and accepted by the District and subject to additions and deductions as provided in the Contract. This amount supersedes any previously stated and/or agreed to amount(s). Contract Price includes Contingency, if any.

20. **No Representations:** No representations have been made other than as set forth in writing in the Contract Documents, including this Agreement. Each of the Parties to this Agreement warrants that it has carefully read and understood the terms and conditions of this Agreement and all Contract Documents, and that it has not relied upon the representations or advice of any other Party or any attorney not its own.

21. **Entire Agreement:** The Contract Documents, including this Agreement, set forth the entire agreement between the parties hereto and fully supersede any and all prior agreements, understandings, written or oral, between the parties hereto pertaining to the subject matter thereof.

22. **Severability**: If any term, covenant, condition, or provision in any of the Contract Documents is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remainder of the provisions in the Contract Documents shall remain in full force and effect and shall in no way be affected, impaired, or invalidated thereby.

23. **Authority of Signatories**: Each party has the full power and authority to enter into and perform this Contract, and the person signing this Contract on behalf of each party has been properly authorized and empowered to enter into this Contract. This Contract may be executed in one or more counterparts, each of which shall be

deemed an original. For this Agreement, and for all Contract Documents requiring a signature, a facsimile or electronic signature shall be deemed to be the equivalent of the actual original signature. All counterparts so executed shall constitute one Contract binding all the Parties hereto.

IN WITNESS WHEREOF, accepted and agreed on the date indicated above:

[CONTRACTOR NAME]	**LODI UNIFIED SCHOOL DISTRICT**
_____	_____
By: _____	By: _____
Title: _____	Title: _____

NOTE: If the party executing this Contract is a corporation, a certified copy of the by-laws, or of the resolution of the Board of Directors, authorizing the officers of said corporation to execute the Contract and the bonds required thereby must be attached hereto.

END OF DOCUMENT

DOCUMENT 00 55 00

NOTICE TO PROCEED

Dated: _____, 20___

TO: _____
("Contractor")

ADDRESS: _____

PROJECT:_____

PROJECT/CONTRACT NO.: _____ between the Lodi Unified School District and Contractor ("Contract").

You are notified that the Contract Time under the above Contract will commence to run on _ _____, 20___. By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement executed by Contractor, the date of completion is _____, 20___.

You must submit the following documents by 5:00 p.m. of the TENTH (10th) calendar day following the date of this Notice to Proceed:

a. Contractor's preliminary schedule of construction.

b. Contractor's preliminary schedule of values for all of the Work.

c. Contractor's preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals.

d. Contractor's Safety Plan specifically adapted for the Project.

e. Registered Subcontractors List: A complete subcontractors list for all tiers, including the name, Department of Industrial Relations registration number, and portion of work.

Thank you. We look forward to a very successful Project.

LODI UNIFIED SCHOOL DISTRICT

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

DOCUMENT 00 56 00
ESCROW BID DOCUMENTATION

1. Requirement to Escrow Bid Documentation

a. Contractor shall submit, within **SEVEN (7)** calendar days after the date of the Notice of Award, one copy of all documentary information received or generated by Contractor in preparation of bid prices for this Contract, as specified herein. This material is referred to herein as "Escrow Bid Documentation." The Escrow Bid Documentation of the Contractor will be held in escrow for the duration of the Contract.

b. Contractor agrees, as a condition of award of the Contract, that the Escrow Bid Documentation constitutes all written information used in the preparation of its bid, and that no other written bid preparation information shall be considered in resolving disputes or claims. Contractor also agrees that nothing in the Escrow Bid Documentation shall change or modify the terms or conditions of the Contract Documents.

c. The Escrow Bid Documentation will not be opened by District except as indicated herein. The Escrow Bid Documentation will be used only for the resolution of change orders and claims disputes.

d. Contractor's submission of the Escrow Bid Documentation, as with the bonds and insurance documents required, is considered an essential part of the Contract award. Should the Contractor fail to make the submission within the allowed time specified above, District may deem the Contractor to have failed to enter into the Contract, and the Contractor shall forfeit the amount of its bid security, accompanying the Contractor's bid, and District may award the Contract to the next lowest responsive responsible bidder.

e. NO PAYMENTS WILL BE MADE, NOR WILL DISTRICT ACCEPT PROPOSED CHANGE ORDERS UNTIL THE ABOVE REQUIRED INFORMATION IS SUBMITTED AND APPROVED.

f. The Escrow Bid Documentation shall be submitted in person by an authorized representative of the Contractor to the District.

2. Ownership of Escrow Bid Documentation

a. The Escrow Bid Documentation is, and shall always remain, the property of Contractor, subject to review by District, as provided herein.

b. Escrow Bid Documentation constitute trade secrets, not known outside Contractor's business, known only to a limited extent and only by a limited number of employees of Contractor, safeguarded while in Contractor's possession, extremely valuable to Contractor, and could be extremely valuable to Contractor's competitors by virtue of reflecting Contractor's contemplated techniques of construction. Subject to the provisions herein, District agrees to safeguard the Escrow Bid Documentation, and all

information contained therein, against disclosure to the fullest extent permitted by law.

3. Format and Contents of Escrow Bid Documentation

a. Contractor may submit Escrow Bid Documentation in its usual cost-estimating format; a standard format is not required. The Escrow Bid Documentation shall be submitted in the language (e.g., English) of the specification.

b. Escrow Bid Documentation must clearly itemize the estimated costs of performing the work of each bid item contained in the bid schedule, separating bid items into sub-items as required to present a detailed cost estimate and allow a detailed cost review. The Escrow Bid Documentation shall include all subcontractor bids or quotes, supplier bids or quotes, quantity takeoffs, crews, equipment, calculations of rates of production and progress, copies of quotes from subcontractors and suppliers, and memoranda, narratives, add/deduct sheets, and all other information used by the Contractor to arrive at the prices contained in the bid proposal. Estimated costs should be broken down into Contractor's usual estimate categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials, and subcontract costs as appropriate. All labor rates must be broken down to specify any and all burden costs including, but not limited to, health and welfare pay, vacation and holiday pay, pension contributions, training rates, benefits of any kind, insurance of any kind, workers' compensation, liability insurance, truck expenses, supply expenses of any kind, payroll taxes, and any other taxes of any kind. Plant and equipment and indirect costs should be detailed in the Contractor's usual format. The Contractor's allocation of indirect costs, contingencies, markup, and other items to each bid item shall be identified.

c. All costs shall be identified. For bid items amounting to less than $10,000, estimated unit costs are acceptable without a detailed cost estimate, provided that labor, equipment, materials, and subcontracts, as applicable, are included and provided that indirect costs, contingencies, and markup, as applicable, are allocated.

d. Bid Documentation provided by District should not be included in the Escrow Bid Documentation unless needed to comply with the following requirements.

4. Submittal of Escrow Bid Documentation

a. The Escrow Bid Documentation shall be submitted by the Contractor in a sealed container within **SEVEN (7)** calendar days after the date of the Notice of Award. The container shall be clearly marked on the outside with the Contractor's name, date of submittal, project name and the words "Escrow Bid Documentation – Intended to be opened in the presence of Authorized Representatives of Both District and Contractor".

b. By submitting Escrow Bid Documentation, Contractor represents that the material in the Escrow Bid Documentation constitutes all the documentary information used in preparation of the bid and that the Contractor has personally examined the contents of the Escrow Bid Documentation container and has found that the documents in the container are complete.

c. If Contractor's proposal is based upon subcontracting any part of the work, each subcontractor whose total subcontract price exceeds 5 percent of the total contract price proposed by Contractor, shall provide separate Escrow Documents to be included with those of Contractor. Those documents shall be opened and examined in the same manner and at the same time as the examination described above for Contractor.

d. If Contractor wishes to subcontract any portion of the Work after award, District retains the right to require Contractor to submit Escrow Documents for the Subcontractor before the subcontract is approved.

5. Storage, Examination and Final Disposition of Escrow Bid Documentation

a. The Escrow Bid Documentation will be placed in escrow, for the life of the Contract, in a mutually agreeable institution. The cost of storage will be paid by Contractor for the duration of the project until final Contract payment. The storage facilities shall be the appropriate size for all the Escrow Bid Documentation and located conveniently to both District's and Contractor's offices.

b. The Escrow Bid Documentation shall be examined by both District and Contractor, at any time deemed necessary by either District or Contractor, to assist in the negotiation of price adjustments and change orders or the settlement of disputes and claims. In the case of legal proceedings, Escrow Bid Documentation shall be used subject to the terms of an appropriate protective order if requested by Contractor and ordered by a court of competent jurisdiction. Examination of the Escrow Bid Documentation is subject to the following conditions:

(1) As trade secrets, the Escrow Bid Documentation is proprietary and confidential to the extent allowed by law.

(2) District and Contractor shall each designate, in writing to the other party **SEVEN (7)** calendar days prior to any examination, the names of representatives who are authorized to examine the Escrow Bid Documentation. No other person shall have access to the Escrow Bid Documentation.

(3) Access to the documents may take place only in the presence of duly designated representatives of the District and Contractor. If Contractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days' notice, then the District representative may examine the Escrow Bid Documents alone upon an additional **THREE (3)** calendar days' notice if a representative of the Contractor does not appear at the time set.

(4) If a subcontractor has submitted sealed information to be included in the Escrow Bid Documents, access to those documents may take place only in the presence of a duly designated representative of the District, Contractor and that subcontractor. If that subcontractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days' notice, then the District representative and/or the

Contractor may examine the Escrow Bid Documentation without that subcontractor present upon an additional **THREE (3)** calendar days' notice if a representative of that subcontractor does not appear at the time set.

c. The Escrow Bid Documentation will be returned to Contractor at such time as the Contract has been completed and final settlement has been achieved.

END OF DOCUMENT

DOCUMENT 00 57 00

ESCROW AGREEMENT IN LIEU OF RETENTION

(Public Contact Code Section 22300)

(Note: Contractor must use this form.)

This Escrow Agreement in Lieu of Retention ("Escrow Agreement") is made and entered into this _____ day of _____, 20___, by and between the Lodi Unified School District ("District"), whose address is 1305 East Vine Street, Lodi, California 95240, and _____ ("Contractor"), whose address is _____ _____ , and _____ ("Escrow Agent"), a state or federally chartered bank in the state of California, whose address is _____.

For the consideration hereinafter set forth, District, Contractor, and Escrow Agent agree as follows:

24. Pursuant to section 22300 of Public Contract Code of the State of California, which is hereby incorporated by reference, Contractor has the following two (2) options:

    ☐ Deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by District pursuant to the Construction Contract No.___ entered into between District and Contractor for the _____ _____ Project, in the amount of _____ Dollars ($_____) dated, _____, 20_____, (the "Contract"); **or**

    ☐ On written request of Contractor, District shall make payments of the retention earnings for the above referenced Contract directly to Escrow Agent.

    When Contractor deposits the securities as a substitute for Contract earnings (first option), Escrow Agent shall notify District within ten (10) calendar days of the deposit. The market value of the securities at the time of substitution and at all times from substitution until the termination of the Escrow Agreement shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between District and Contractor.

    Securities shall be held in the name of Lodi Unified School District, and shall designate Contractor as beneficial owner.

25. District shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified above.

26. When District makes payment of retentions earned directly to Escrow Agent, Escrow Agent shall hold them for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow

Agreement and the rights and responsibilities of the Parties shall be equally applicable and binding when District pays Escrow Agent directly.

27. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of District. The District will charge Contractor $_____ for each of District's deposits to the escrow account. These expenses and payment terms shall be determined by District, Contractor, and Escrow Agent.

28. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to District.

29. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from District to Escrow Agent that District consents to withdrawal of amount sought to be withdrawn by Contractor.

30. District shall have the right to draw upon the securities and/or withdraw amounts from the Escrow Account in the event of default by Contractor. Upon seven (7) days' written notice to Escrow Agent from District of the default, if applicable, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by District. Escrow Agent shall not be authorized to determine the validity of any notice of default given by District pursuant to this paragraph, and shall promptly comply with District's instructions to pay over said escrowed assets. Escrow Agent further agrees to not interplead the escrowed assets in response to a conflicting demand.

31. Upon receipt of written notification from District certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payments of fees and charges.

32. Escrow Agent shall rely on written notifications from District and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Escrow Agreement and District and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth above.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

33. Names of persons who are authorized to give written notice or to receive written notice on behalf of District and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of District:

Title

Name

Signature

Address

On behalf of Contractor:

Title

Name

Signature

Address

On behalf of Escrow Agent:

Title

Name

Signature

Address

At the time that the Escrow Account is opened, District and Contractor shall deliver to Escrow Agent a fully executed copy of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

On behalf of District:

Title

Name

Signature

Address

On behalf of Contractor:

Title

Name

Signature

Address

END OF DOCUMENT

DOCUMENT 00 61 13.13
PERFORMANCE BOND

(100% of Contract Price)

(Note: Contractor must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the governing board ("Board") of the Lodi Unified School District, ("District") and _____ _____ ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

_____

("Project" or "Contract") which Contract dated _____, 20___, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof; and

WHEREAS, said Principal is required under the terms of the Contract to furnish a bond for the faithful performance of the Contract.

NOW, THEREFORE, the Principal and _____ _____ ("Surety") are held and firmly bound unto the Board of the District in the penal sum of

_____

Dollars ($_____), lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents, to:

- Promptly perform all the work required to complete the Project; and
- Pay to the District all damages the District incurs as a result of the Principal's failure to perform all the Work required to complete the Project.

Or, at the District's sole discretion and election, the Surety shall obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by the District of the lowest responsible bidder, arrange for a contract between such bidder and the District and make available as Work progresses sufficient funds to pay the cost of completion less the "balance of the Contract Price," and to pay and perform all obligations of Principals under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of liquidated damages. The term "balance of the Contract Price," as used in this paragraph, shall mean the total amount payable to Principal by the District under the Contract and any modifications thereto, less the amount previously paid by the District to the Principal, less any withholdings by the District allowed under the Contract. District shall not be required or obligated to accept a tender of a completion contractor from the Surety for any or no reason.

The condition of the obligation is such that, if the above bound Principal, its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in the Contract and any alteration

thereof made as therein provided, on its part to be kept and performed at the time and in the intent and meaning, including all contractual guarantees and warrantees of materials and workmanship, and shall indemnify and save harmless the District, its trustees, officers and agents, as therein stipulated, then this obligation shall become null and void, otherwise it shall be and remain in full force and virtue.

Surety expressly agrees that the District may reject any contractor or subcontractor proposed by Surety to fulfill its obligations in the event of default by the Principal. Surety shall not utilize Principal in completing the Work nor shall Surety accept a Bid from Principal for completion of the Work if the District declares the Principal to be in default and notifies Surety of the District's objection to Principal's further participation in the completion of the Work.

As a condition precedent to the satisfactory completion of the Contract, the above obligation shall hold good for a period equal to the warranty and/or guarantee period of the Contract, during which time Surety's obligation shall continue if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the District from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the District's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

The Surety, for value received, 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 the specifications accompanying the same shall in any way affect its obligation on this bond. The Surety also stipulates and agrees that it shall not be exonerated or released from the obligation of this bond by any overpayment or underpayment by the District that is based upon estimates approved by the Architect. The Surety does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the specifications.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the _____ day of _____, 20___.

Principal	Surety
By	By
	Name of California Agent of Surety
	Address of California Agent of Surety
	Telephone No. of California Agent of Surety

Contractor must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT

DOCUMENT 00 61 13.16
PAYMENT BOND

Contractor's Labor & Material Bond (100% Of Contract Price)

(Note: Contractor must use this form, NOT a surety company form.)
KNOW ALL PERSONS BY THESE PRESENTS:
WHEREAS, the governing board ("Board") of the Lodi Unified School District, ("District") and , ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

("Project" or "Contract") which Contract dated , 20___, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof; and
WHEREAS, pursuant to law and the Contract, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by which the Contract is awarded in an amount equal to one hundred percent (100%) of the Contract price, to secure the claims to which reference is made in sections 9000 through 9510 and 9550 through 9566 of the Civil Code, and division 2, part 7, of the Labor Code.
NOW, THEREFORE, the Principal and ("Surety") are held and firmly bound unto all laborers, material men, and other persons referred to in said statutes in the sum of Dollars ($), lawful money of the United States, being a sum not less than the total amount payable by the terms of Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.
The condition of this obligation is that if the Principal or any of its subcontractors, or their heirs, executors, administrators, successors, or assigns of any, all, or either of them shall fail to pay for any labor, materials, provisions, or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Principal or any of his or its subcontractors of any tier under Section 13020 of the Unemployment Insurance Code with respect to such work or labor, that the Surety will pay the same in an amount not exceeding the amount herein above set forth, and also in case suit is brought upon this bond, will pay a reasonable attorney's fee to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.
It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under section 9100 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.
Should the condition of this bond be fully performed, then this obligation shall become null and void; otherwise it shall be and remain in full force and affect.
And the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of Contract or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the day of , 20___.

Principal	Surety
By	By
	Name of California Agent of Surety
	Address of California Agent of Surety
	Telephone No. of California Agent of Surety

Contractor must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT

DOCUMENT 00 63 40

CONTINGENCY EXPENDITURE DIRECTIVE

Project: _____ **Date:** _____
Bid No.: _____ **DSA File No.:**_____
PCO No.: _____ **DSA Appl. No.**_____

You are hereby directed to proceed with the following change(s) in this Contract:

(Contractor documentation supporting proper completion of work must be attached.)

Total Contract Contingency Amount:	$
Amount of Previously Approved Contingency Expenditure Directive(s):	$
Amount of this Contingency Expenditure Directive:	$

The undersigned Contractor approves the foregoing release of Contingency for completion of each specified item, and agrees to furnish all labor, materials and services and perform all work necessary to complete any additional work specified for the consideration stated therein ("Work"). Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650, et seq. This Contingency Expenditure Directive must be signed by an authorized District representative. It is expressly understood that the authorized contingency expenditure granted herein represents a full accord and satisfaction for any and all cost impacts of the items herein, and Contractor waives any and all further compensation based on the items herein. The value of the extra work or changes expressly includes any and all of the Contractor's costs and expenses, and its subcontractors, both direct and indirect. Any costs, expenses, or damages not included are deemed waived.

Signatures:

DISTRICT: LODI UNIFIED SCHOOL DISTRICT Date: _____ By:_Edith Holbert, Executive Director of Ops.	**CONTRACTOR:** _____ Date: _____ By:_____ [Print Name and Title here]
ARCHITECT: _____ Date: _____ By:_____ [Print Name and Title here]	**CM:** _____ Date: _____ By:_____ [Print Name and Title here]

END OF DOCUMENT

DOCUMENT 00 63 40.1

ALLOWANCE EXPENDITURE DIRECTIVE

Project: _____ **Date:** _____
Bid No.: _____ **DSA File No.:**_____
PCO No.: _____ **DSA Appl. No.**_____

You are hereby directed to proceed with the following change(s) in this Contract:

(Contractor documentation supporting proper completion of work must be attached.)

Total Contract Allowance Amount:	$
Amount of Previously Approved Allowance Expenditure Directive(s):	$
Amount of this Allowance Expenditure Directive:	$

The undersigned Contractor approves the foregoing release of Allowance for completion of each specified item, and agrees to furnish all labor, materials and services and perform all work necessary to complete any additional work specified for the consideration stated therein ("Work"). Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650, et seq. This Allowance Expenditure Directive must be signed by an authorized District representative. It is expressly understood that the authorized allowance expenditure granted herein represents a full accord and satisfaction for any and all cost impacts of the items herein, and Contractor waives any and all further compensation based on the items herein. The value of the extra work or changes expressly includes any and all of the Contractor's costs and expenses, and its subcontractors, both direct and indirect. Any costs, expenses, or damages not included are deemed waived.

Signatures:

DISTRICT: LODI UNIFIED SCHOOL DISTRICT Date: _____ By:_Edith Holbert, Executive Director of Ops.	**CONTRACTOR:** _____ Date: _____ By:_____ [Print Name and Title here]
ARCHITECT: _____ Date: _____ By:_____ [Print Name and Title here]	**CM:** _____ Date: _____ By:_____ [Print Name and Title here]

END OF DOCUMENT

DOCUMENT 00 63 47

DAILY FORCE ACCOUNT REPORT

From: Contractor
[Name/Address]

To: Owner
[Name/Address]

Project: _____

Contractor hereby submits this Daily Force Account Report for Work performed, pursuant to Force Account Directive No. _____, on _____.
[Date of Work]

Contractor attests that the material, labor, and equipment itemized herein were used only on the force account work.

A. Material: *Attach all applicable invoices not provided in prior Daily Force Account Reports and complete the information below.*

Description	Unit Price	Quantity	Cost

Daily subtotal (w/out markup): $_____

B. Labor: *Labor must be fully Burdened. Attach timesheets, if applicable, and complete the information below.*

Name	Craft	Regular Hrs.	Rate	OT Hrs.	Rate

Daily subtotal (w/out markup): $_____

C. **Equipment:** *Attach all applicable invoices not provided in prior Daily Force Account Reports and complete the information below.*

Type / Model	Hrs. Operated	Rate

Daily subtotal (w/out markup): $_____

Complete based on information reported above.

	WORK PERFORMED OTHER THAN BY CONTRACTOR	ADD
(a)	**Material**	
(b)	**Add Labor**	
(c)	**Add Equipment**	
(d)	**Subtotal**	
(e)	**Add overhead and profit for any and all tiers of Subcontractor**, the total not to exceed ten percent (10%) of Item (d)	
(f)	**Subtotal**	
(g)	**Add Overhead and Profit for Contractor**, not to exceed five percent (5%) of Item (f)	
(h)	**Subtotal**	
(i)	**Add Bond and Insurance**, not to exceed two percent (2%) of Item (h)	
(j)	**TOTAL**	

	WORK PERFORMED BY CONTRACTOR	ADD
(a)	**Material**	
(b)	**Add Labor**	
(c)	**Add Equipment**	
(d)	**Subtotal**	
(e)	**Add Overhead and Profit for Contractor**, not to exceed fifteen percent (15%) of Item (d)	
(f)	**Subtotal**	
(g)	**Add Bond and Insurance**, not to exceed two percent (2%) of Item (f)	
(h)	**TOTAL**	

Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act (Gov. Code, § 12650 et seq.).

It is expressly understood that all force account work for the date stated above must be reported herein, and Contractor may not claim any labor, equipment, material or any other costs or expenses not reported herein. Contractor is not entitled to separately recover amounts for overhead or other indirect costs. Any costs, expenses, or damages, not included are deemed waived.

SUBMITTED BY:		**REVIEWED BY:**	
Contractor:		District:	
[Name]	Date	[Name]	Date

District may require additional information from Contractor to review this Daily Force Account Report. Upon District's return of the Daily Force Account Report, Contractor may invoice the Work reflected therein. District's review and return of the Daily Force Account Report and/or payment for the force account work does not constitute acceptance of the Work or waiver of any Contract rights or criteria.

END OF DOCUMENT

DOCUMENT 00 63 63
CHANGE ORDER FORM

Lodi Unified School District
1305 East Vine Street
Lodi, CA 95240

CHANGE ORDER NO.:

CHANGE ORDER

Project: _____
Bid No.: _____

Date: _____
DSA File No.: _____
DSA Appl. No.:_____

The following parties agree to the terms of this Change Order:

Owner: _____
[Name / Address]
_____
_____

Contractor: _____
[Name / Address]
_____
_____

Architect: _____
[Name / Address]
_____
_____

Project Inspector: _____
[Name / Address]
_____
_____

Reference	**Description**	**Cost**	**Days Ext.**
PCO # Requested by: Performed by: Reason:	[Description of change] [Requester] [Performer] [Reason]	$	
PCO # Requested by: Performed by: Reason:	[Description of change] [Requester] [Performer] [Reason]	$	
PCO # Requested by: Performed by: Reason:	[Description of change] [Requester] [Performer] [Reason]	$	

Contract time will be adjusted as follows: Previous Completion Date: [Date] _____[#] Calendar Days Extension (zero unless otherwise indicated) Current Completion Date: [Date]	Original Contract Amount:	$
	Amount of Previously Approved Change Order(s):	$
	Amount of this Change Order:	$
	Contract Amount:	$

The undersigned Contractor approves the foregoing as to the changes, if any, to the Contract Price specified for each item, and as to the extension of time allowed, if any, for completion of the entire work as stated therein, and agrees to furnish all labor, materials

and services and perform all work necessary to complete any additional work specified for the consideration stated therein. Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq.

This change order is subject to approval by the governing board of this District and must be signed by the District. Until such time as this change order is approved by the District's governing board and executed by a duly authorized District representative, this change order is not effective and not binding.

It is expressly understood that the compensation and time, if any, granted herein represent a full accord and satisfaction for any and all time and cost impacts of the items herein, and Contractor waives any and all further compensation or time extension based on the items herein. The value of the extra work or changes expressly includes any and all of the Contractor's costs and expenses, and its subcontractors, both direct and indirect, resulting from additional time required on the project or resulting from delay to the project including without limitation, cumulative impacts. Any costs, expenses, damages or time extensions not included are deemed waived.

Signatures:

District:		Contractor:	
_____	_____	_____	_____
[Name]	Date	[Name]	Date
Architect:		Project Inspector:	
_____	_____	_____	_____
[Name]	Date	[Name]	Date

END OF DOCUMENT

DOCUMENT 00 65 19.26

AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS

THIS AGREEMENT AND RELEASE OF CLAIMS ("Agreement and Release") IS MADE AND ENTERED INTO THIS _____ DAY OF _____, 20___ by and between the LODI UNIFIED SCHOOL DISTRICT ("District") and _____ _____ ("Contractor"), whose place of business is _____ _____.

RECITALS

WHEREAS, District and Contractor entered into PROJECT/CONTRACT NO.: _____ _____ ("Contract" or "Project") in the County of San Joaquin, California; and

WHEREAS, the Work under the Contract was completed on _____, and a Notice of Completion was recorded with the County Recorder on _____.

NOW, THEREFORE, it is mutually agreed between District and Contractor as follows:

AGREEMENT AND RELEASE

34. Contractor will only be assessed liquidated damages as detailed below:

Original Contract Sum	$_____
Modified Contract Sum	$_____
Payment to Date	$_____
Liquidated Damages	$_____
Payment Due Contractor	$_____

35. Subject to the provisions hereof, District shall forthwith pay to Contractor the undisputed sum of Dollars ($) under the Contract, less any amounts represented by any notice to withhold funds on file with District as of the date of such payment.

36. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against District arising from the performance of work under the Contract, except for the claims described in Paragraph 4 and continuing obligations described in Paragraph 6. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against District and all of its respective agents, employees, trustees, inspectors, assignees, consultants and transferees, except for any Disputed Claim that may be set forth in Paragraph 4 and the continuing obligations described in Paragraph 6 hereof.

37. The following claims are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release:

Claim No.	Description of Claim	Amount of Claim	Date Claim Submitted
_____	_____	$_____	_____
_____	_____	$_____	_____
_____	_____	$_____	_____
_____	_____	$_____	_____
_____	_____	$_____	_____
_____	_____	$_____	_____

[If further space is required, attach additional sheets showing the required information.]

38. Consistent with California Public Contract Code section 7100, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 2 hereof, Contractor hereby releases and forever discharges District, all its agents, employees, inspectors, assignees, and transferees from any and all liability, claims, demands, actions, or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.

39. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, including without limitation, the duty to defend, indemnify and hold harmless the District, shall remain in full force and effect as specified in the Contract Documents.

40. Contractor hereby waives the provisions of California Civil Code section 1542 which provides as follows:

> A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS THAT THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE AND THAT, IF KNOWN BY HIM OR HER, WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASED PARTY.

41. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable. If any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal, or other law, ruling, or regulations, then such provision, or part thereof, shall remain in force and effect to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

42. All rights of District shall survive completion of the Work or termination of Contract, and execution of this Release.

* * * CAUTION: THIS IS A RELEASE - READ BEFORE EXECUTING * * *

LODI UNIFIED SCHOOL DISTRICT

Signature: _____

Print Name: _____

Title: _____

CONTRACTOR: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 65 36
GUARANTEE FORM

_____ ("Contractor") hereby agrees that the _____ _____ ("Work" of Contractor) which Contractor has installed for the Lodi Unified School District ("District") for the following project:

PROJECT: **Project Name Project No.**

("Project" or "Contract") has been performed in accordance with the requirements of the Contract Documents and that the Work as installed will fulfill the requirements of the Contract Documents.

The undersigned agrees to repair or replace any or all of such Work that may prove to be defective in workmanship or material together with any other adjacent Work that may be displaced in connection with such replacement within a period of _____ year(s) from the date of completion as defined in Public Contract Code section 7107, subdivision (c), ordinary wear and tear and unusual abuse or neglect excepted. The date of completion is _____, 20___.

In the event of the undersigned's failure to comply with the above-mentioned conditions within a reasonable period of time, as determined by the District, but not later than seven (7) days after being notified in writing by the District, the undersigned authorizes the District to proceed to have said defects repaired and made good at the expense of the undersigned. The undersigned shall pay the costs and charges therefor upon demand.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

Representatives to be contacted for service subject to terms of Contract:

Name: _____

Address: _____

Phone No.: _____

Email: _____

END OF DOCUMENT

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GENERAL CONDITIONS

1. CONTRACT TERMS AND DEFINITIONS

1.1 Definitions

Wherever used in the Contract Documents, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof:

1.1.1 Adverse Weather: Shall be only weather that satisfies all of the following conditions: (1) unusually severe precipitation, sleet, snow, hail, or extreme temperature conditions in excess of the norm for the location and time of year it occurred based on the closest weather station data averaged over the past five years, (2) that is unanticipated and would cause unsafe work conditions and/or is unsuitable for scheduled work that should not be performed during inclement weather (i.e., exterior finishes), and (3) at the Project.

1.1.2 Allowance(s): The Allowance Item(s) identified in the Bid Form and Proposal and included in the Contract Price. Any unused portion of the Allowance will revert to the District documented by a deductive Change Order. Contractor hereby authorizes the District to execute a unilateral deductive Change Order at or near the end of the Project for all or any portion of the Allowance not allocated.

1.1.3 Allowance Expenditure Directive: Written authorization for expenditure of an Allowance, if any. Contractor shall not bill for or be due any portion of an Allowance unless the District has identified specific work, Contractor has submitted a price for that work or the District has proposed a price for that work, the District has accepted the cost for that work, and the District has executed an Allowance Expenditure Directive incorporating that work.

1.1.4 Approval, Approved, and/or Accepted: Written authorization, unless stated otherwise.

1.1.5 Architect (or "Design Professional in General Responsible Charge"): The individual, partnership, corporation, joint venture, or any combination thereof, named as Architect, who will have the rights and authority assigned to the Architect in the Contract Documents. The term Architect means the Design Professional in General Responsible Charge as defined in DSA PR 13-02 on this Project or the Architect's authorized representative.

1.1.6 As-Builts: Reproducible blue line prints of drawings to be prepared on a monthly basis pursuant to the Contract Documents, that reflect changes made during the performance of the Work, recording differences between the original design of the Work and the Work as constructed since the preceding monthly submittal. See **Record Drawings**.

1.1.7 Bidder: A contractor who intends to provide a proposal to the District to perform the Work of this Contract.

1.1.8 Burdened: The labor rate for Contractor or any Subcontractor inclusive of any and all burden costs including, but not limited to, health and welfare pay, vacation and holiday pay, pension contributions, training rates, benefits of any kind, insurance of any kind, workers' compensation, liability insurance, truck expenses, supply expenses of any kind, payroll taxes, and any other taxes of any kind.

1.1.9 Change Order: A written order to the Contractor authorizing an addition to, deletion from, or revision in the Work, and/or authorizing an adjustment in the Contract Price or Contract Time.

1.1.10 Claim: A Contractor Claim within the meaning of Public Contract Code sections 9204 and/or 20104 et seq.

1.1.11 Construction Change Directive: A written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District and the Architect, directing a change in the Work.

1.1.12 Construction Manager: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Construction Manager is used on the Project that is the subject of this Contract, then all references to Construction Manager herein shall be read to refer to District.

1.1.13 Construction Schedule: The progress schedule of construction of the Project as provided by Contractor and approved by District.

1.1.14 Contract, Contract Documents: The Contract consists exclusively of the documents evidencing the agreement of the District and Contractor, identified as the Contract Documents. The Contract Documents consist of the following documents:

1.1.14.1 Notice to Bidders
1.1.14.2 Instructions to Bidders
1.1.14.3 Bid Form and Proposal
1.1.14.4 Bid Bond
1.1.14.5 Designated Subcontractors List
1.1.14.6 Site Visit Certification (if a site visit was required)
1.1.14.7 Non-Collusion Declaration
1.1.14.8 Off-Road Diesel-Fueled Fleet Certification (if applicable)
1.1.14.9 Notice of Award
1.1.14.10 Notice to Proceed
1.1.14.11 Agreement
1.1.14.12 Escrow of Bid Documentation
1.1.14.13 Escrow Agreement for Security Deposits in Lieu of Retention (if applicable)
1.1.14.14 Performance Bond
1.1.14.15 Payment Bond (Contractor's Labor & Material Bond)
1.1.14.16 General Conditions
1.1.14.17 Special Conditions (if applicable)
1.1.14.18 Project Labor Agreement (if applicable)

1.1.14.19 Hazardous Materials Procedures and Requirements
1.1.14.20 Workers' Compensation Certification
1.1.14.21 Prevailing Wage Certification
1.1.14.22 Disabled Veteran Business Enterprise Participation Certification (if applicable)
1.1.14.23 Drug-Free Workplace Certification (if applicable)
1.1.14.24 Tobacco-Free Environment Certification (if applicable)
1.1.14.25 Drug and Alcohol-Free Schools Certification (if applicable)
1.1.14.26 Hazardous Materials Certification (if applicable)
1.1.14.27 Lead-Based Materials Certification (if applicable)
1.1.14.28 Imported Materials Certification (if applicable)
1.1.14.29 Criminal Background Investigation/Fingerprinting Certification
1.1.14.30 Roofing Project Certification (if applicable)
1.1.14.31 Registered Subcontractors List
1.1.14.32 Iran Contracting Act Certification (if applicable)
1.1.14.33 Federal Debarment Certification (if applicable)
1.1.14.34 Federal Byrd Anti-Lobbying Certification (if applicable)
1.1.14.35 Post Bid Interview (if used)
1.1.14.36 All Plans, Technical Specifications, and Drawings
1.1.14.37 Any and all addenda to any of the above documents
1.1.14.38 Any and all change orders or written modifications to the above documents if approved in writing by the District

1.1.15 Contract Price: The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

1.1.16 Contract Time: The time period stated in the Agreement for the completion of the Work.

1.1.17 Contractor: The person or persons identified in the Agreement as contracting to perform the Work to be done under this Contract, or the legal representative of such a person or persons.

1.1.18 Daily Job Report(s): Daily Project reports prepared by the Contractor's employee(s) who are present on Site, which shall include the information required herein.

1.1.19 Day(s): Unless otherwise designated, day(s) means calendar day(s).

1.1.20 Department of Industrial Relations (or "DIR"): is responsible, among other things, for labor compliance monitoring and enforcement of California prevailing wage laws and regulations for public works contracts.

1.1.21 Design Professional in General Responsible Charge: See definition of **Architect** above.

1.1.22 Dispute: A separate demand by Contractor for a time extension, or payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly

provided for or Contractor is not otherwise entitled to; or an amount of payment disputed by the District.

1.1.23 District: The public agency or the school district for which the Work is performed. The governing board of the District or its designees will act for the District in all matters pertaining to the Contract. The District may, at any time,

1.1.23.1 Direct the Contractor to communicate with or provide notice to the Construction Manager or the Architect on matters for which the Contract Documents indicate the Contractor will communicate with or provide notice to the District; and/or

1.1.23.2 Direct the Construction Manager or the Architect to communicate with or direct the Contractor on matters for which the Contract Documents indicate the District will communicate with or direct the Contractor.

1.1.24 Drawings (or "Plans"): The graphic and pictorial portions of the Contract Documents showing the design, location, scope and dimensions of the work, generally including plans, elevations, sections, details, schedules, sequence of operation, and diagrams.

1.1.25 DSA: Division of the State Architect.

1.1.26 Force Account Directive: A process that may be used when the District and the Contractor cannot agree on a price for a specific portion of work or before the Contractor prepares a price for a specific portion of work and whereby the Contractor performs the work as indicated herein on a time and materials basis.

1.1.27 Job Cost Reports: Any and all reports or records detailing the costs associated with work performed on or related to the Project that Contractor shall maintain for the Project. Specifically, Job Cost Reports shall contain, but are not limited by or to, the following information: a description of the work performed or to be performed on the Project; quantity, if applicable, of work performed (hours, square feet, cubic yards, pounds, etc.) for the Project; Project budget; costs for the Project to date; estimated costs to complete the Project; and expected costs at completion. The Job Cost Reports shall also reflect all Contract cost codes, change orders, elements of non-conforming work, back charges, and additional services.

1.1.28 Labor Commissioner's Office (or "Labor Commissioner", also known as the Division of Labor Standards Enforcement ("DLSE")): Division of the DIR responsible for adjudicating wage claims, investigating discrimination and public works complaints, and enforcing Labor Code statutes and Industrial Welfare Commission orders.

1.1.29 Municipal Separate Storm Sewer System (or "MS4"): A system of conveyances used to collect and/or convey storm water, including, without limitation, catch basins, curbs, gutters, ditches, man-made channels, and storm drains.

1.1.30 Plans: See **Drawings**.

1.1.31 Premises: The real property owned by the District on which the Site is located.

1.1.32 Product(s): New material, machinery, components, equipment, fixtures and systems forming the Work, including existing materials or components required and approved by the District for reuse.

1.1.33 Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.

1.1.34 Program Manager: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Program Manager is designated for Project that is the subject of this Contract, then all references to Project Manager herein shall be read to refer to District.

1.1.35 Project: The planned undertaking as provided for in the Contract Documents.

1.1.36 Project Inspector (or "Inspector"): The individual(s) retained by the District in accordance with title 24 of the California Code of Regulations to monitor and inspect the Project.

1.1.37 Project Labor Agreement (or "PLA"): a prehire collective bargaining agreement in accordance with Public Contract Code section 2500 et seq. that establishes terms and conditions of employment for a specific construction project or projects and/or is an agreement described in Section 158(f) of Title 29 of the United States Code.

1.1.38 Proposed Change Order (or "PCO"): a written request prepared by the Contractor requesting that the District and the Architect issue a Change Order based upon a proposed change to the Work.

1.1.39 Provide: Shall include "provide complete in place," that is, "furnish and install," and "provide complete and functioning as intended in place" unless specifically stated otherwise.

1.1.40 Qualified SWPPP Practitioners (or "QSP"): certified personnel that attended a State Water Resources Control Board sponsored or approved training class and passed the qualifying exam.

1.1.41 Record Drawings: Reproducible drawings (or Plans) prepared pursuant to the requirements of the Contract Documents that reflect all changes made during the performance of the Work, recording differences between the original design of the Work and the Work as constructed upon completion of the Project. See also **As-Builts**.

1.1.42 Request for Information (or "RFI"): A written request prepared by the Contractor requesting that the Architect provide additional information necessary

to clarify or amplify an item in the Contract Documents that the Contractor believes is not clearly shown or called for in the Drawings or Specifications or other portions of the Contract Documents, or to address problems that have arisen under field conditions.

1.1.43 Request for Substitution for Specified Item: A request by Contractor to substitute an equal or superior material, product, thing, or service for a specific material, product, thing, or service that has been designated in the Contract Documents by a specific brand or trade name.

1.1.44 Safety Orders: Written and/or verbal orders for construction issued by the California Division of Occupational Safety and Health ("CalOSHA") or by the United States Occupational Safety and Health Administration ("OSHA").

1.1.45 Safety Plan: Contractor's safety plan specifically adapted for the Project. Contractor's Safety Plan shall comply with all provisions regarding Project safety, including all applicable provisions in these General Conditions.

1.1.46 Samples: Physical examples that illustrate materials, products, equipment, finishes, colors, or workmanship and that, when approved in accordance with the Contract Documents, establish standards by which portions of the Work will be judged.

1.1.47 Shop Drawings: All drawings, prints, diagrams, illustrations, brochures, schedules, and other data that are prepared by the Contractor, a subcontractor, manufacturer, supplier, or distributor, that illustrate how specific portions of the Work shall be fabricated or installed.

1.1.48 Site: The Project site as shown on the Drawings.

1.1.49 Specifications: That portion of the Contract Documents, Division 1 through Division 49, and all technical sections, and addenda to all of these, if any, consisting of written descriptions and requirements of a technical nature of materials, equipment, construction methods and systems, standards, and workmanship.

1.1.50 State: The State of California.

1.1.51 Storm Water Pollution Prevention Plan (or "SWPPP"): A document which identifies sources and activities at a particular facility that may contribute pollutants to storm water and contains specific control measures and time frames to prevent or treat such pollutants.

1.1.52 Subcontractor: A contractor and/or supplier who is under contract with the Contractor or with any other subcontractor, regardless of tier, to perform a portion of the Work of the Project.

1.1.53 Submittal Schedule: The schedule of submittals as provided by Contractor and approved by District.

1.1.54 **Surety**: The person, firm, or corporation that executes as surety the Contractor's Performance Bond and Payment Bond, and must be a California admitted surety insurer as defined in the Code of Civil Procedure section 995.120.

1.1.55 **Work**: All labor, materials, equipment, components, appliances, supervision, coordination, and services required by, or reasonably inferred from, the Contract Documents, that are necessary for the construction and completion of the Project.

1.2 Laws Concerning the Contract; Venue

Contract is subject to all provisions of the Constitution and laws of California and the United States governing, controlling, or affecting District, or the property, funds, operations, or powers of District, and such provisions are by this reference made a part hereof. Any provision required by law to be included in this Contract shall be deemed to be inserted.

To the fullest extent permitted by California law, the county in which the District administration office is located shall be the venue for any action or proceeding that may be brought or arise out of, in connection with or by reason of this Contract.

1.3 No Oral Agreements

No oral agreement or conversation with any officer, agent, or employee of District, either before or after execution of Contract, shall affect or modify any of the terms or obligations contained in any of the documents comprising the Contract.

1.4 No Assignment

Contractor shall not assign this Contract or any part thereof including, without limitation, any Work or money to become due hereunder without the prior written consent of the District. Assignment without District's prior written consent shall be null and void. Any assignment of money due or to become due under this Contract shall be subject to a prior lien for services rendered or material supplied for performance of work called for under this Contract in favor of all persons, firms, or corporations rendering services or supplying material to the extent that claims are filed pursuant to the Civil Code, Code of Civil Procedure, Government Code, Labor Code, and/or Public Contract Code, and shall also be subject to deductions for liquidated damages or withholding of payments as determined by District in accordance with this Contract. Contractor shall not assign or transfer in any manner to a Subcontractor or supplier the right to prosecute or maintain an action against the District.

1.5 Notice and Service Thereof

1.5.1 Any notice from one party to the other or otherwise under Contract shall be in writing and shall be dated and signed by the party giving notice or by a duly authorized representative of that party. Any notice shall not be effective for any purpose whatsoever unless served in one of the following manners:

1.5.1.1 If notice is given by personal delivery thereof, it shall be considered delivered on the day of delivery.

1.5.1.2 If notice is given by overnight delivery service, it shall be considered delivered one (1) day after date deposited, as indicated by the delivery service.

1.5.1.3 If notice is given by depositing same in United States mail, enclosed in a sealed envelope, it shall be considered delivered three (3) days after date deposited, as indicated by the postmarked date.

1.5.1.4 If notice is given by registered or certified mail with postage prepaid, return receipt requested, it shall be considered delivered on the day the notice is signed for.

1.5.1.5 Electronic mail may be used for convenience but is not a substitute for the notice and service requirements herein.

1.6 No Waiver

The failure of District in any one or more instances to insist upon strict performance of any of the terms of this Contract or to exercise any option herein conferred shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon any such terms or option on any future occasion. No action or failure to act by the District, Architect, or Construction Manager shall constitute a waiver of any right or duty afforded the District under the Contract, nor shall any action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

1.7 Substitutions for Specified Items

Unless the Special Conditions contain different provisions, Contractor shall not substitute different items for any items identified in the Contract Documents without prior written approval of the District.

1.8 Materials and Work

1.8.1 Except as otherwise specifically stated in this Contract, Contractor shall provide and pay for all materials, labor, tools, equipment, transportation, supervision, temporary constructions of every nature, and all other services, management, and facilities of every nature whatsoever necessary to execute and complete this Contract, in a good and workmanlike manner, within the Contract Time.

1.8.2 Unless otherwise specified, all materials shall be new and of the best quality of their respective kinds and grades as noted or specified, workmanship shall be of good quality, and Contractor shall use all diligence to inform itself fully as to the required manufacturer's instructions and to comply therewith.

1.8.3 Materials shall be furnished in ample quantities and at such times as to insure uninterrupted progress of Work and shall be stored properly and protected from the elements, theft, vandalism, or other loss or damage as required.

1.8.4 For all materials and equipment specified or indicated in the Drawings, the Contractor shall provide all labor, materials, equipment, and services necessary for complete assemblies and complete working systems, functioning as intended. Incidental items not indicated on Drawings, nor mentioned in the Specifications, that can legitimately and reasonably be inferred to belong to the Work described, or be necessary in good practice to provide a complete assembly or system, shall be furnished as though itemized here in every detail. In all instances, material and equipment shall be installed in strict accordance with each manufacturer's most recent published recommendations and specifications.

1.8.5 Contractor shall, after award of Contract by District and after relevant submittals have been reviewed, place orders for materials and/or equipment as specified so that delivery of same may be made without delays to the Work. Contractor shall, upon five (5) days' demand from District, present documentary evidence showing that orders have been placed.

1.8.6 District reserves the right but has no obligation, in response to Contractor's neglect or failure in complying with the above instructions, to place orders for such materials and/or equipment as the District may deem advisable in order that the Work may be completed at the date specified in the Contract, and all expenses incidental to the procuring of said materials and/or equipment shall be paid for by Contractor or deducted from payment(s) to Contractor.

1.8.7 Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver the Site to District, together with all improvements and appurtenances constructed or placed thereon by it, and free from any claims, liens, or charges. Contractor further agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any work covered by the Contract shall have any right to lien any portion of the Premises or any improvement or appurtenance thereon, except that Contractor may install metering devices or other equipment of utility companies or of political subdivision, title to which is commonly retained by utility company or political subdivision. In the event of installation of any such metering device or equipment, Contractor shall advise District as to owner thereof.

1.8.7.1 If a lien or a claim based on a stop payment notice of any nature should at any time be filed against the Work or any District property, by any entity that has supplied material or services at the request of the Contractor, Contractor and Contractor's Surety shall promptly, on demand by District and at Contractor's and Surety's own expense, take any and all action necessary to cause any such lien or a claim based on a stop payment notice to be released or discharged immediately therefrom.

1.8.7.2 If the Contractor fails to furnish to the District within ten (10) calendar days after demand by the District, satisfactory evidence that a lien or a claim based on a stop payment notice has been so released, discharged, or secured,

the District may discharge such indebtedness and deduct the amount required therefor, together with any and all losses, costs, damages, and attorney's fees and expense incurred or suffered by District from any sum payable to Contractor under the Contract.

1.8.8 Nothing contained in this Article, however, shall defeat or impair the rights of persons furnishing materials or labor under any bond given by Contractor for their protection or any rights under any law permitting such protection or any rights under any law permitting such persons to look to funds due Contractor in hands of District (e.g., stop payment notices), and this provision shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing material for work when no formal contract is entered into for such material.

1.8.9 Title to new materials and/or equipment for the Work of this Contract and attendant liability for its protection and safety shall remain with Contractor until incorporated in the Work of this Contract and accepted by District. No part of any materials and/or equipment shall be removed from its place of storage except for immediate installation in the Work of this Contract. Should the District, in its discretion, allow the Contractor to store materials and/or equipment for the Work off-site, Contractor will store said materials and/or equipment at a bonded warehouse and with appropriate insurance coverage at no cost to District. Contractor shall keep an accurate inventory of all materials and/or equipment in a manner satisfactory to District or its authorized representative and shall, at the District's request, forward it to the District.

1.8.10 [RESERVED]

2. [RESERVED]

3. ARCHITECT

3.1 The Architect shall represent the District during the Project and will observe the progress and quality of the Work on behalf of the District. Architect shall have the authority to act on behalf of District to the extent expressly provided in the Contract Documents and to the extent determined by District. Architect shall have authority to reject materials, workmanship, and/or the Work whenever rejection may be necessary, in Architect's reasonable opinion, to ensure the proper execution of the Contract.

3.2 Architect shall, with the District and on behalf of the District, determine the amount, quality, acceptability, and fitness of all parts of the Work, and interpret the Specifications, Drawings, and shall, with the District, interpret all other Contract Documents.

3.3 Architect shall have all authority and responsibility established by law, including title 24 of the California Code of Regulations.

3.4 Contractor shall provide District and the Construction Manager with a copy of all written communication between Contractor and Architect at the same time as that

communication is made to Architect, including, without limitation, all RFIs, correspondence, submittals, claims, and proposed change orders.

4. CONSTRUCTION MANAGER

4.1 If a Construction Manager is used on this Project ("Construction Manager" or "CM"), the Construction Manager will provide administration of the Contract on the District's behalf. After execution of the Contract and Notice to Proceed, all correspondence and/or instructions from Contractor and/or District shall be forwarded through the Construction Manager. The Construction Manager will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures or for safety precautions in connection with the Work, which shall all remain the Contractor's responsibility.

4.2 The Construction Manager, however, will have authority to reject materials and/or workmanship not conforming to the Contract Documents, as determined by the District, the Architect, and/or the Project Inspector. The Construction Manager shall also have the authority to require special inspection or testing of any portion of the Work, whether it has been fabricated, installed, or fully completed. Any decision made by the Construction Manager, in good faith, shall not give rise to any duty or responsibility of the Construction Manager to: the Contractor; any Subcontractor; the Contractor or Subcontractor's respective agents, employees; or other persons performing any of the Work. The Construction Manager shall have free access to any or all parts of Work at any time.

4.3 If the District does not use a Construction Manager on this Project, all references within the Contract Documents to Construction Manager or CM shall be read as District.

5. INSPECTOR, INSPECTIONS, AND TESTS

5.1 Project Inspector

5.1.1 One or more Project Inspector(s), including special Project Inspector(s), as required, will be assigned to the Work by District, in accordance with requirements of title 24, part 1, of the California Code of Regulations, to enforce the building code and monitor compliance with Plans and Specifications for the Project previously approved by the DSA. Duties of Project Inspector(s) are specifically defined in section 4-342 of said part 1 of title 24.

5.1.2 No Work shall be carried on except with the knowledge and under the inspection of the Project Inspector(s). The Project Inspector(s) shall have free access to any or all parts of Work at any time. Contractor shall furnish Project Inspector(s) reasonable opportunities for obtaining such information as may be necessary to keep Project Inspector(s) fully informed respecting progress and manner of work and character of materials, including, but not limited to, submission of form DSA 156 (or the most current version applicable at the time the Work is performed) to the Project Inspector at least 48 hours in advance of the commencement and completion of construction of each and every aspect of the Work. Forms are available on the DSA's website at:

http://www.dgs.ca.gov/dsa/Forms.aspx. Inspection of Work shall not relieve Contractor from an obligation to fulfill this Contract. Project Inspector(s) and the DSA are authorized to suspend work whenever the Contractor and/or its Subcontractor(s) are not complying with the Contract Documents. Any work stoppage by the Project Inspector(s) and/or DSA shall be without liability to the District. Contractor shall instruct its Subcontractors and employees accordingly.

5.1.3 If Contractor and/or any Subcontractor requests that the Project Inspector(s) perform any inspection off-site, this shall only be done if it is allowable pursuant to applicable regulations and DSA approval, if the Project Inspector(s) agree to do so, and at the expense of the Contractor.

5.2 Tests and Inspections

5.2.1 Tests and Inspections shall comply with title 24, part 1, California Code of Regulations, group 1, article 5, section 4-335, and with the provisions of the Specifications.

5.2.2 The District will select an independent testing laboratory to conduct the tests. Selection of the materials required to be tested shall be by the laboratory or the District's representative and not by the Contractor. The Contractor shall notify the District's representative a sufficient time in advance of its readiness for required observation or inspection.

5.2.3 The Contractor shall notify the District's representative a sufficient time in advance of the manufacture of material to be supplied under the Contract Documents, which must by terms of the Contract Documents be tested, in order that the District may arrange for the testing of same at the source of supply. This notice shall be provided, at a minimum, seventy-two (72) hours prior to the manufacture of the material that needs to be tested.

5.2.4 Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required, shall not be incorporated into and/or onto the Project.

5.2.5 The District will select the testing laboratory and pay for the cost of all tests and inspections, excepting those inspections performed at Contractor's request and expense. Contractor shall reimburse the District for any and all laboratory costs or other testing costs for any materials found to be not in compliance with the Contract Documents. At the District's discretion, District may elect to deduct laboratory or other testing costs for noncompliant materials from the Contract Price, and such deduction shall not constitute a withholding.

5.3 Costs for After Hours and/or Off Site Inspections

If the Contractor performs Work outside the Inspector's regular working hours or requests the Inspector to perform inspections off Site, costs of any inspections required outside regular working hours or off Site shall be borne by the Contractor and may be

invoiced to the Contractor by the District or the District may deduct those expenses from the next Progress Payment.

6. CONTRACTOR

Contractor shall construct and complete, in a good and workmanlike manner, the Work for the Contract Price including any adjustment(s) to the Contract Price pursuant to provisions herein regarding changes to the Contract Price. Except as otherwise noted, Contractor shall provide and pay for all labor, materials, equipment, permits (excluding DSA), fees, licenses, facilities, transportation, taxes, bonds and insurance, and services necessary for the proper execution and completion of the Work, except as indicated herein.

6.1 Status of Contractor

6.1.1 Contractor represents and warrants that Contractor is an independent contractor or business entity that is: (i) free from the control and direction of the District in connection with the performance of the Services, (ii) performing Services that are outside the usual course of the District's business, and (iii) customarily engaged in an independently established trade, occupation, or business of the same nature as that involved in the Services performed, District being interested only in the results obtained. Contractor understands and agrees that it and all of its employees and its Subcontractors shall not be considered officers, employees, agents, partner, or joint venture of the District, and are not entitled to benefits of any kind or nature normally provided employees of the District and/or to which District's employees are normally entitled, including, but not limited to, State Unemployment Compensation or Worker's Compensation. Contractor shall assume full responsibility for payment of all federal, state, and local taxes or contributions, including unemployment insurance, social security, and income taxes with respect to Consultant's employees. Contractor is and shall at all times be wholly responsible for the manner in which it, its agents, and its Subcontractors perform the services required of it by the Contract Documents. Nothing herein contained shall be construed as creating the relationship of employer and employee, or principal and agent, between the District, or any of the District's employees or agents, and Contractor or any of Contractor's Subcontractors, agents or employees. District shall be permitted to monitor the Contractor's activities to determine compliance with the terms of this Contract.

6.1.2 As required by law, Contractor and all Subcontractors shall be properly licensed and regulated by the Contractors State License Board, 9821 Business Park Drive, Sacramento, California 95827, http://www.cslb.ca.gov.

6.1.3 As required by law, Contractor and all Subcontractors shall be properly registered as public works contractors by the Department of Industrial Relations at: https://efiling.dir.ca.gov/PWCR/ActionServlet?action=displayPWCRegistrationForm or current URL.

6.1.4 Contractor represents that Contractor and all Subcontractors shall not be presently debarred, suspended, proposed for disbarment, declared ineligible or excluded pursuant to either Labor Code section 1777.1 or Labor Code section 1777.7.

6.1.5 [RESERVED]

6.1.6 Contractor represents that it has no existing interest and will not acquire any interest, direct or indirect, which could conflict in any manner or degree with the performance of Work required under this Contract and that no person having any such interest shall be employed by Contractor.

6.1.7 [RESERVED]

6.1.8 If Contractor intends to make any change in the name or legal nature of the Contractor's entity, Contractor must first notify the District in writing prior to making any contemplated change. The District shall determine in writing if Contractor's intended change is permissible while performing this Contract.

6.2 Project Inspection Card(s)

Contractor shall verify that forms DSA 152 (or the current version applicable at the time the Work is performed) are issued for the Project prior to the commencement of construction.

6.3 Contractor's Supervision

6.3.1 During progress of the Work, Contractor shall keep on the Premises, and at all other locations where any Work related to the Contract is being performed, an experienced and competent project manager and construction superintendent who are employees of the Contractor, to whom the District does not object and at least one of whom shall be fluent in English, written and verbal.

6.3.2 The project manager and construction superintendent shall both speak fluently the predominant language of the Contractor's employees.

6.3.3 Before commencing the Work herein, Contractor shall give written notice to District of the name of its project manager and construction superintendent. Neither the Contractor's project manager nor construction superintendent shall be changed except with prior written notice to District. If the Contractor's project manager and/or construction superintendent proves to be unsatisfactory to Contractor, or to District, any of the District's employees, agents, the Construction Manager, or the Architect, the unsatisfactory project manager and/or construction superintendent shall be replaced. However, Contractor shall notify District in writing before any change occurs, but no less than two (2) business days prior. Any replacement of the project manager and/or construction superintendent shall be made promptly and must be satisfactory to the District. The Contractor's project manager and construction superintendent shall each represent Contractor, and all directions given to Contractor's project manager and/or construction superintendent shall be as binding as if given to Contractor.

6.3.4 Contractor shall give efficient supervision to Work, using its best skill and attention. Contractor shall carefully study and compare all Contract Documents, Drawings, Specifications, and other instructions and shall at once report to District, Construction Manager, and Architect any error, inconsistency, or omission that

Contractor or its employees and Subcontractors may discover, in writing, with a copy to District's Project Inspector(s). The Contractor shall have responsibility for discovery of errors, inconsistencies, or omissions.

6.4 Duty to Provide Fit Workers

6.4.1 Contractor and Subcontractor(s) shall at all times enforce strict discipline and good order among their employees and shall not employ or work any unfit person or anyone not skilled in work assigned to that person. It shall be the responsibility of Contractor to ensure compliance with this requirement. District may require Contractor to permanently remove unfit persons from Project Site.

6.4.2 Any person in the employ of Contractor or Subcontractor(s) whom District may deem incompetent or unfit shall be excluded from working on the Project and shall not again be employed on the Project except with the prior written consent of District.

6.4.3 The Contractor shall furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work.

6.4.4 Fingerprinting. Contractor shall comply with the provisions of Education Code section 45125.2 regarding the submission of employee fingerprints to the California Department of Justice and the completion of criminal background investigations of its employees, its subcontractor(s), and its subcontractors' employees. Contractor shall not permit any employee to have any contact with District pupils until such time as Contractor has verified in writing to the governing board of the District, (A) that such employee has not been convicted of a violent or serious felony, as defined in Education Code section 45122.1 and/or (B) that the prohibition does not apply to an employee as provided by Education Code section 45125.1(e)(2) or (3). Contractor shall fully complete and perform all tasks required pursuant to the Criminal Background Investigation/ Fingerprinting Certification.

6.5 Field Office

6.5.1 Contractor shall provide a temporary office on the Site for the District's use exclusively, during the term of the Contract.

6.6 Purchase of Materials and Equipment

The Contractor is required to order, obtain, and store materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from District to assure that there will be no delays.

6.7 Documents on Work

6.7.1 Contractor shall at all times keep on the Site, or at another location as the District may authorize in writing, one legible copy of all Contract Documents, including Addenda and Change Orders, and Titles 19 and 24 of the California Code of Regulations, the specified edition(s) of the Uniform Building Code, all approved Drawings, Plans, Schedules, and Specifications, and all codes and documents

referred to in the Specifications, and made part thereof. These documents shall be kept in good order and available to District, Construction Manager, Architect, Architect's representatives, the Project Inspector(s), and all authorities having jurisdiction. Contractor shall be acquainted with and comply with the provisions of these titles as they relate to this Project. (See particularly the duties of Contractor, Title 24, Part 1, California Code of Regulations, section 4-343.) Contractor shall also be acquainted with and comply with all California Code of Regulations provisions relating to conditions on this Project, particularly Titles 8 and 17. Contractor shall coordinate with Architect and Construction Manager and shall submit its verified report(s) according to the requirements of Title 24.

6.7.2 Daily Job Reports.

6.7.2.1 Contractor shall maintain, at a minimum, at least one (1) set of Daily Job Reports on the Project. These must be prepared by the Contractor's employee(s) who are present on Site, and must include, at a minimum, the following information:

6.7.2.1.1 A brief description of all Work performed on that day.
6.7.2.1.2 A summary of all other pertinent events and/or occurrences on that day.
6.7.2.1.3 The weather conditions on that day.
6.7.2.1.4 A list of all Subcontractor(s) working on that day, including DIR registration numbers.
6.7.2.1.5 A list of each Contractor employee working on that day and the total hours worked for each employee.
6.7.2.1.6 A complete list of all equipment on Site that day, whether in use or not.
6.7.2.1.7 A complete list of all materials, supplies, and equipment delivered on that day.
6.7.2.1.8 A complete list of all inspections and tests performed on that day.

6.7.2.2 Each day Contractor shall provide a copy of the previous day's Daily Job Report to the District or the Construction Manager.

6.8 Preservation of Records

Contractor shall maintain, and District shall have the right to inspect, Contractor's financial records for the Project, including, without limitation, Job Cost Reports for the Project in compliance with the criteria set forth herein. The District shall have the right to examine and audit all Daily Job Reports or other Project records of Contractor's project manager(s), project superintendent(s), and/or project foreperson(s), all certified payroll records and/or related documents including, without limitation, Job Cost Reports, payroll, payment, timekeeping and tracking documents; all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports, and other data of the Contractor, any Subcontractor, and/or supplier, including computations and projections related to bidding, negotiating, pricing, or performing the Work or Contract modification, in order to evaluate the accuracy, completeness, and currency of the cost, manpower, coordination, supervision, or pricing data at no additional cost to

the District. These documents may be duplicative and/or be in addition to any Bid Documents held in escrow by the District. The Contractor shall make available at its office at all reasonable times the materials described in this paragraph for the examination, audit, or reproduction until three (3) years after final payment under this Contract. Notwithstanding the provisions above, Contractor shall provide any records requested by any governmental agency, if available, after the time set forth above.

6.9 Integration of Work

6.9.1 Contractor shall do all cutting, fitting, patching, and preparation of Work as required to make its several parts come together properly, to fit it to receive or be received by work of other contractors, and to coordinate tolerances to various pieces of work, showing upon, or reasonably implied by, the Drawings and Specifications for the completed structure, and shall conform them as District and/or Architect may direct.

6.9.2 Contractor shall make its own layout of lines and elevations and shall be responsible for the accuracy of both Contractor's and Subcontractors' work resulting therefrom.

6.9.3 Contractor and all Subcontractors shall take all field dimensions required in performance of the Work and shall verify all dimensions and conditions on the Site. All dimensions affecting proper fabrication and installation of all Work must be verified prior to fabrication by taking field measurements of the true conditions. If there are any discrepancies between dimensions in drawings and existing conditions which will affect the Work, Contractor shall bring such discrepancies to the attention of the District and Architect for adjustment before proceeding with the Work. In doing so, it is recognized that Contractor is not acting in the capacity of a licensed design professional, and that Contractor's examination is made in good faith to facilitate construction and does not create an affirmative responsibility of a design professional to detect errors, omissions or inconsistencies in the Contract Documents or to ascertain compliance with applicable laws, building codes or regulations. However, nothing in this provision shall abrogate Contractor's responsibilities for discovering and reporting any error, inconsistency, or omission pursuant to the Contract within the Contractor's standard of care including, without limitation, any applicable laws, ordinance, rules, or regulations. Following receipt of written notice from Contractor, the District and/or Architect shall inform Contractor what action, if any, Contractor shall take with regard to such discrepancies.

6.9.4 All costs caused by noncompliant, defective, or delayed Work shall be borne by Contractor, inclusive of repair work. Schedule delays resulting from unauthorized work shall be Contractor's responsibility.

6.9.5 Contractor shall not endanger any work performed by it or anyone else by cutting, excavating, or otherwise altering work and shall not cut or alter work of any other contractor except with consent of District.

6.10 Notifications

6.10.1 Contractor shall notify the Architect and Project Inspector, in writing, of the commencement of construction of each and every aspect of the Work at least 48 hours in advance by submitting form DSA 156 (or the most current version applicable at the time the Work is performed) to the Project Inspector. Forms are available on the DSA's website at: http://www.dgs.ca.gov/dsa/Forms.aspx.

6.10.2 Contractor shall notify the Architect and Project Inspector, in writing, of the completion of construction of each and every aspect of the Work at least 48 hours in advance by submitting form DSA 156 (or current version) to the Project Inspector.

6.11 Obtaining of Permits, Licenses and Registrations

6.11.1 Contractor shall secure and pay for all permits (except DSA), licenses, registrations, approvals and certificates necessary for prosecution of Work, including but not limited to those listed in the Special Conditions, if any, before the date of the commencement of the Work or before the permits, licenses, registrations, approvals and certificates are legally required to continue the Work without interruption. The Contractor shall obtain and pay, only when legally required, for all licenses, registrations, approvals, permits, inspections, and inspection certificates required to be obtained from or issued by any authority having jurisdiction over any part of the Work included in the Contract. All final permits, licenses, registrations, approvals and certificates shall be delivered to District before demand is made for final payment.

6.11.2 General Permit For Storm Water Discharges Associated With Construction and Land Disturbance Activities.

6.11.2.1 Contractor acknowledges that all California school districts are obligated to develop and implement the following requirements for the discharge of storm water to surface waters from its construction and land disturbance activities pursuant to the Clean Water Act and Porter Cologne Water Quality Act. District has determined that the construction of this Project requires enrollment in the Construction Storm Water Permit. District has filed certain submittals referred to as Permit Registration Documents ("PRDS") with the Regional Water Control Board ("Storm Water Pollution Prevention Plan" or "SWPPP").

6.11.2.2 Contractor shall comply with any District SWPPP that is approved by the District and applicable to the Project, at no additional cost to the District. Contractor shall pay any fees and any penalties that may imposed by a regulatory agency for its non-compliance with the SWPPP during the course of Work.

6.11.2.3 Contractor shall provide a Qualified Storm Water Practitioner ("QSP") at no additional cost to the District, who shall perform on-site inspections and implement and monitor any and all SWPPP requirements applicable to the Project, including required visual observations, sampling, analysis, reporting and record keeping, including of Total Maximum Daily Loads ("TMDL") of pollutants

and construction dewatering and discharge, and Best Management Practices ("BMPs").

6.12 Royalties and Patents

6.12.1 Contractor shall obtain and pay, only when legally required, all royalties and license fees necessary for prosecution of Work before the earlier of the date of the commencement of the Work or the date that the license is legally required to continue the Work without interruption. Contractor shall defend suits or claims of infringement of patent, copyright, or other rights and shall hold the District, the Architect, and the Construction Manager harmless and indemnify them from loss on account thereof except when a particular design, process, or make or model of product is required by the Contract Documents. However, if the Contractor has reason to believe that the required design, process, or product is an infringement of a patent or copyright, the Contractor shall indemnify and defend the District, Architect and Construction Manager against any loss or damage unless the Contractor promptly informs the District of its information.

6.12.2 The review by the District or Architect of any method of construction, invention, appliance, process, article, device, or material of any kind shall be only its adequacy for the Work and shall not approve use by the Contractor in violation of any patent or other rights of any person or entity.

6.13 Work to Comply With Applicable Laws and Regulations

6.13.1 Contractor shall give all notices and comply with the following specific laws, ordinances, rules, and regulations and all other applicable laws, ordinances, rules, and regulations bearing on conduct of Work as indicated and specified, including but not limited to the appropriate statutes and administrative code sections. If Contractor observes that Drawings and Specifications are at variance therewith, or should Contractor become aware of the development of conditions not covered by Contract Documents that may result in finished Work being at variance therewith, Contractor shall promptly notify District in writing and any changes deemed necessary by District shall be made as provided in Contract for changes in Work.

6.13.1.1 National Electrical Safety Code, U. S. Department of Commerce

6.13.1.2 National Board of Fire Underwriters' Regulations

6.13.1.3 International Building Code, latest addition, and the California Code of Regulations, title 24, and other amendments

6.13.1.4 Manual of Accident Prevention in Construction, latest edition, published by A.G.C. of America

6.13.1.5 Industrial Accident Commission's Safety Orders, State of California

6.13.1.6 Regulations of the State Fire Marshall (title 19, California Code of Regulations) and Pertinent Local Fire Safety Codes

6.13.1.7 Americans with Disabilities Act

6.13.1.8 Education Code of the State of California

6.13.1.9 Government Code of the State of California

6.13.1.10 Labor Code of the State of California, division 2, part 7, Public Works and Public Agencies

6.13.1.11 Public Contract Code of the State of California

6.13.1.12 California Art Preservation Act

6.13.1.13 U. S. Copyright Act

6.13.1.14 U. S. Visual Artists Rights Act

6.13.2 Contractor shall comply with all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act (Public Resources Code section 21000 et seq.).

6.13.3 If Contractor performs any Work that it knew, or through exercise of reasonable care should have known, to be contrary to any applicable laws, ordinance, rules, or regulations, Contractor shall bear all costs arising therefrom and arising from the correction of said Work.

6.13.4 Where Specifications or Drawings state that materials, processes, or procedures must be approved by the DSA, State Fire Marshall, or other body or agency, Contractor shall be responsible for satisfying requirements of such bodies or agencies applicable at the time the Work is performed, and as determined by those bodies or agencies.

6.13.5 [RESERVED]

6.14 Safety/Protection of Persons and Property

6.14.1 The Contractor will be solely and completely responsible for conditions of the Site, including safety of all persons and property during performance of the Work. This requirement will apply continuously and not be limited to normal working hours.

6.14.2 The wearing of hard hats will be mandatory at all times for all personnel on Site. Contractor shall supply sufficient hard hats to properly equip all employees and visitors.

6.14.3 Any construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the Site.

6.14.4 Implementation and maintenance of safety programs shall be the sole responsibility of the Contractor.

6.14.5 The Contractor shall furnish to the District a copy of the Contractor's safety plan within the time frame indicated in the Contract Documents and specifically adapted for the Project.

6.14.6 Contractor shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the prosecution of this Contract and shall take all necessary measures and be responsible for the proper care and completion and final acceptance by District. All Work shall be solely at Contractor's risk with the exception of damage to the Work caused by "acts of God" as defined in Public Contract Code section 7105.

6.14.7 Contractor shall take, and require Subcontractors to take, all necessary precautions for safety of workers on the Project and shall comply with all applicable federal, state, local, and other safety laws, standards, orders, rules, regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where Work is being performed and to provide a safe and healthful place of employment. Contractor shall furnish, erect, and properly maintain at all times, all necessary safety devices, safeguards, construction canopies, signs, nets, barriers, lights, and watchmen for protection of workers and the public and shall post danger signs warning against hazards created by such features in the course of construction.

6.14.8 Hazards Control – Contractor shall store volatile wastes in covered metal containers and remove them from the Site daily. Contractor shall prevent accumulation of wastes that create hazardous conditions. Contractor shall provide adequate ventilation during use of volatile or noxious substances.

6.14.9 Contractor shall designate a responsible member of its organization on the Project, whose duty shall be to post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety, and health of workers. Name and position of person so designated shall be reported to District by Contractor.

6.14.10 Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health, Contractor shall correct such violation promptly.

6.14.11 Contractor shall comply with any District storm water requirements that are approved by the District and applicable to the Project, at no additional cost to the District.

6.14.12 In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization, shall act, at its discretion, to prevent such threatened loss or injury. Any compensation claimed by Contractor on account of emergency work shall be determined by agreement.

6.14.13 All salvage materials will become the property of the Contractor and shall be removed from the Site unless otherwise called for in the Contract Documents. However, the District reserves the right to designate certain items of value that shall be turned over to the District unless otherwise directed by District.

6.14.14 All connections to public utilities and/or existing on-site services, including, without limitation, internet, phone and data connections, shall be made and maintained in such a manner as to not interfere with the continuing use of same by the District during the entire progress of the Work.

6.14.15 Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions, such as extreme heat, cold, rain, snow, dry winds, flooding, or dampness.

6.14.16 Contractor shall protect and preserve the Work from all damage or accident, providing any temporary roofs, window and door coverings, boxings, or other construction as required by the Architect. The Contractor shall be responsible for existing structures, walks, roads, trees, landscaping, and/or improvements in working areas; and shall provide adequate protection therefore. If temporary removal is necessary of any of the above items, or damage occurs due to the Work, the Contractor shall replace same at his expense with same kind, quality, and size of Work or item damaged. This shall include any adjoining property of the District and others.

6.14.17 Contractor shall take adequate precautions to protect existing roads, sidewalks, curbs, pavements, utilities, adjoining property, and structures (including, without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto, and repair any damage thereto caused by construction operations.

6.14.18 Contractor shall confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits, or directions of Architect, and shall not interfere with the Work or unreasonably encumber Premises or overload any structure with materials. Contractor shall enforce all instructions of District and Architect regarding signs, advertising, fires, and smoking, and require that all workers comply with all regulations while on Project Site.

6.14.19 Contractor, Contractor's employees, Subcontractors, Subcontractors' employees, or any person associated with the Work shall conduct themselves in a manner appropriate for a school site. No verbal or physical contact with neighbors, students, and faculty, profanity, or inappropriate attire and/or logos, or behavior will be permitted. District may require Contractor to temporarily or permanently remove non-complying persons from Project Site.

6.14.20 Contractor shall take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed, Contractor shall have a civil engineer, registered as a professional engineer in California, replace them at no cost to District.

6.14.21 In the event that the Contractor enters into any agreement with owners of any adjacent property to enter upon the adjacent property for the purpose of performing the Work, Contractor shall fully indemnify, defend, and hold harmless each person, entity, firm, or agency that owns or has any interest in adjacent property. The form and content of the agreement of indemnification shall be approved by the District prior to the commencement of any Work on or about the adjacent property. The Contractor shall also indemnify the District as provided in the indemnification provision herein. These provisions shall be in addition to any other requirements of the owners of the adjacent property.

6.15 Working Evenings and Weekends

Contractor may be required to work increased hours, evenings, and/or weekends at no additional cost to the District. Contractor shall give the District seventy-two (72) hours' notice prior to performing any evening and/or weekend work. Contractor shall perform all evening and/or weekend work only upon District's approval and in compliance with all applicable rules, regulations, laws, and local ordinances including, without limitation, all noise and light limitations. Contractor shall reimburse the District for any increased or additional Inspector charges as a result of Contractor's increased hours, or evening and/or weekend work.

6.16 Cleaning Up

6.16.1 The Contractor shall provide all services, labor, materials, and equipment necessary for protecting and securing the Work, all school occupants, furnishings, equipment, and building structure from damage until its completion and final acceptance by District. Dust barriers shall be provided to isolate dust and dirt from construction operations. At completion of the Work and portions thereof, Contractor shall clean to the original state any areas beyond the Work area that become dust laden as a result of the Work. The Contractor must erect the necessary warning signs and barricades to ensure the safety of all school occupants. The Contractor at all times must maintain good housekeeping practices to reduce the risk of fire damage and must make a fire extinguisher, fire blanket, and/or fire watch, as applicable, available at each location where cutting, braising, soldering, and/or welding is being performed or where there is an increased risk of fire.

6.16.2 Contractor at all times shall keep Premises, including property immediately adjacent thereto, free from debris such as waste, rubbish (including personal rubbish of workers, e.g., food wrappers, etc.), and excess materials and equipment caused by the Work. Contractor shall not leave debris under, in, or about the Premises (or surrounding property or neighborhood), but shall promptly remove same from the Premises on a daily basis. If Contractor fails to clean up, District may do so and the cost thereof shall be charged to Contractor. If Contract is for work on an existing facility, Contractor shall also perform specific clean-up on or about the Premises upon request by the District as it deems necessary for continued operations. Contractor shall comply with all related provisions of the Specifications.

6.16.3 If the Construction Manager, Architect, or District observes the accumulation of trash and debris, the District will give the Contractor a 24-hour written notice to mitigate the condition.

6.16.4 Should the Contractor fail to perform the required clean-up, or should the clean-up be deemed unsatisfactory by the District, the District may, at its sole discretion, then perform the clean-up. All cost associated with the clean-up work (including all travel, payroll burden, and costs for supervision) will be deducted from the Contract Price.

6.17 No Relief from Obligations Based on Review by Other Persons

6.17.1 Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents by act or omission of the District, Architect, Construction Manager, Project Inspector, or DSA or other entities having jurisdiction including, but not limited to, administration of the Contract, review of submittals, or by tests, observation, inspection, or permit/interconnection approvals.

7. SUBCONTRACTORS

7.1 Contractor shall provide the District with information for all Subcontracts as indicated in the Contractor's Submittals and Schedules Section herein.

7.2 No contractual relationship exists between the District and any Subcontractor, supplier, or sub-subcontractor by reason of this Contract.

7.3 Contractor agrees to bind every Subcontractor by terms of this Contract as far as those terms that are applicable to Subcontractor's work including, without limitation, all labor, wage & hour, apprentice and related provisions and requirements. If Contractor shall subcontract any part of this Contract, Contractor shall be as fully responsible to District for acts and omissions of any Subcontractor and of persons either directly or indirectly employed by any Subcontractor, including Subcontractor caused Project delays, as it is for acts and omissions of persons directly employed by Contractor. The divisions or sections of the Specifications and/or the arrangement of the drawings are not intended to control the Contractor in dividing the Work among Subcontractors or limit the work performed by any trade.

7.4 District's consent to, or approval of, or failure to object to, any Subcontractor under this Contract shall not in any way relieve Contractor of any obligations under this Contract and no such consent shall be deemed to waive any provisions of this Contract.

7.5 Contractor is directed to familiarize itself with sections 4100 through 4114 of the Public Contract Code of the State of California, as regards subletting and subcontracting, and to comply with all applicable requirements therein. In addition, Contractor is directed to familiarize itself with sections 1720 through 1861 of the Labor Code of the State of California, as regards the payment of prevailing wages and related issues, and to comply with all applicable requirements therein including, without limitation, section 1775 and the Contractor's and Subcontractors' obligations and liability for violations of prevailing wage law and other applicable laws.

7.6 No Contractor whose Bid is accepted shall, without consent of the awarding authority and in full compliance with section 4100 et seq. of the Public Contract Code,

including, without limitation, sections 4107, 4107.5, and 4109 of the Public Contract Code, and section 1771.1 of the Labor Code, either:

7.6.1 Substitute any person as a Subcontractor in place of the Subcontractor designated in the original Bid; or

7.6.2 Permit any Subcontract to be assigned or transferred, or allow any portion of the Work to be performed by anyone other than the original Subcontractor listed in the Bid; or

7.6.3 Sublet or subcontract any portion of the Work in excess of one-half of one percent (0.5%) of the Contractor's total bid as to which his original bid did not designate a Subcontractor.

7.7 The Contractor shall be responsible for the coordination of the trades, Subcontractors, sub-subcontractors, and material or equipment suppliers working on the Project.

7.7.1 If the Contract is valued at $1 million or more and uses, or plans to use, state bond funds, then Contractor is responsible for ensuring that first tier Subcontractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46 licenses are prequalified by the District to work on the Project pursuant to Public Contract Code section 20111.6.

7.7.2 Contractor is responsible for ensuring that all Subcontractors are properly registered as public works contractors by the Department of Industrial Relations.

7.8 Contractor is solely responsible for settling any differences between the Contractor and its Subcontractor(s) or between Subcontractors.

7.9 Contractor must include in all of its subcontracts the assignment provisions as indicated in the Termination section of these General Conditions.

8. OTHER CONTRACTS/CONTRACTORS

8.1 District reserves the right to let other contracts, and/or to perform work with its own forces, in connection with the Project. Contractor shall afford other contractors reasonable opportunity for introduction and storage of their materials and execution of their work and shall properly coordinate and connect Contractor's Work with the work of other contractors.

8.2 In addition to Contractor's obligation to protect its own Work, Contractor shall protect the work of any other contractor that Contractor encounters while working on the Project.

8.3 If any part of Contractor's Work depends for proper execution or results upon work of District or any other contractor, the Contractor shall inspect and, before proceeding with its Work, promptly report to the District in writing any defects in District's or any other contractor's work that render Contractor's Work unsuitable for proper execution and results. Contractor shall be held accountable for damages to

District for District's or any other contractor's work that Contractor failed to inspect or should have inspected. Contractor's failure to inspect and report shall constitute Contractor's acceptance of all District's or any other contractor's work as fit and proper for reception of Contractor's Work, except as to defects that may develop in District's or any other contractor's work after execution of Contractor's Work and not caused by execution of Contractor's Work.

8.4 To ensure proper execution of its subsequent work, Contractor shall measure and inspect work already in place and shall at once report to the District in writing any discrepancy between that executed work and the Contract Documents.

8.5 Contractor shall ascertain to its own satisfaction the scope of the Project and nature of District's or any other contracts that have been or may be awarded by District in prosecution of the Project to the end that Contractor may perform this Contract in light of the other contracts, if any.

8.6 Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy of the Site, the Premises, or of the Project. Contractor shall not cause any unnecessary hindrance or delay to the use and/or operation(s) of the Premises and/or to District or any other contractor working on the Project. If simultaneous execution of any contract or Premises operation is likely to cause interference with performance of Contractor's Contract, Contractor shall coordinate with those contractor(s), person(s), and/or entity(s) and shall notify the District of the resolution.

9. DRAWINGS AND SPECIFICATIONS

9.1 A complete list of all Drawings that form a part of the Contract is to be found as an index on the Drawings themselves, and/or may be provided to the Contractor and/or in the Table of Contents.

9.2 Materials or Work described in words that so applied have a well-known technical or trade meaning shall be deemed to refer to recognized standards, unless noted otherwise.

9.3 **Trade Name or Trade Term.** It is not the intention of this Contract to go into detailed descriptions of any materials and/or methods commonly known to the trade under "trade name" or "trade term." The mere mention or notation of "trade name" or "trade term" shall be considered a sufficient notice to Contractor that it will be required to complete the work so named, complete, finished, and operable, with all its appurtenances, according to the best practices of the trade.

9.4 The naming of any material and/or equipment shall mean furnishing and installing of same, including all incidental and accessory items thereto and/or labor therefor, as per best practices of the trade(s) involved, unless specifically noted otherwise.

9.5 Contract Documents are complementary, and what is called for by one shall be binding as if called for by all. As such, Drawings and Specifications are intended to be fully cooperative and to agree. However, if Contractor observes that Drawings and

Specifications are in conflict with the Contract Documents, Contractor shall promptly notify District and Architect in writing, and any necessary changes shall be made as provided in the Contract Documents.

9.6 In the case of discrepancy or ambiguity in the Contract Documents, the order of precedence in the Agreement shall prevail. However, in the case of discrepancy or ambiguity solely between and among the Drawings and Specifications, the discrepancy or ambiguity shall be resolved in favor of the interpretation that will provide District with the functionally complete and operable Project described in the Drawings and Specifications. In case of ambiguity, conflict, or lack of information, District will furnish clarifications with reasonable promptness.

9.7 Drawings and Specifications are intended to comply with all laws, ordinances, rules, and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, the laws, ordinances, rules, and regulations shall be considered as a part of the Contract within the limits specified. Contractor shall bear all expense of correcting work done contrary to said laws, ordinances, rules, and regulations.

9.8 As required by Section 4-317(c), Part 1, Title 24, CCR: "Should any existing conditions such as deterioration or non-complying construction be discovered which is not covered by the DSA-approved documents wherein the finished work will not comply with Title 24, California Code of Regulations, a construction change document, or a separate set of plans and specifications, detailing and specifying the required repair work shall be submitted to and approved by DSA before proceeding with the repair work."

9.9 Ownership of Drawings

All copies of Plans, Drawings, Designs, Specifications, and copies of other incidental architectural and engineering work, or copies of other Contract Documents furnished by District, are the property of District. They are not to be used by Contractor in other work and, with the exception of signed sets of Contract Documents, are to be returned to District on request at completion of Work, or may be used by District as it may require without any additional costs to District. Neither the Contractor nor any Subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by the Architect. District hereby grants the Contractor, Subcontractors, sub-subcontractors, and material or equipment suppliers a limited license to use applicable portions of the Drawings prepared for the Project in the execution of their Work under the Contract Documents.

10. CONTRACTOR'S SUBMITTALS AND SCHEDULES

Contractor's submittals shall comply with the provisions and requirements of the Specifications including, without limitation Submittals.

10.1 Schedule of Work, Schedule of Submittals, and Schedule of Values

10.1.1 Within **TEN (10)** calendar days after the date of the Notice to Proceed (unless otherwise specified in the Specifications), the Contractor shall prepare and

submit to the District for review, in a form supported by sufficient data to substantiate its accuracy as the District may require:

10.1.1.1 Preliminary Schedule. A preliminary schedule of construction indicating the starting and completion dates of the various stages of the Work, including any information and following any form as may be specified in the Specifications. Once approved by District, this shall become the Construction Schedule. This schedule shall include and identify all tasks that are on the Project's critical path with a specific determination of the start and completion of each critical path task as well as all Contract milestones and each milestone's completion date(s) as may be required by the District.

10.1.1.1.1 The District is not required to approve a preliminary schedule of construction with early completion, i.e., one that shows early completion dates for the Work and/or milestones. Contractor shall not be entitled to extra compensation if the District approves a Construction Schedule with an early completion date and Contractor completes the Project beyond the date shown in the schedule but within the Contract Time. A Construction Schedule showing the Work completed in less than the Contract Time, the time between the early completion date and the end of the Contract Time shall be Float.

10.1.1.2 Preliminary Schedule of Values. A preliminary schedule of values for all of the Work, which must include quantities and prices of items aggregating the Contract Price and must subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Unless the Special Conditions contain different limits, this preliminary schedule of values shall include, at a minimum, the following information and the following structure:

10.1.1.2.1 Divided into at least the following categories:

10.1.1.2.1.1 Overhead and profit;
10.1.1.2.1.2 Supervision;
10.1.1.2.1.3 General conditions;
10.1.1.2.1.4 Layout;
10.1.1.2.1.5 Mobilization;
10.1.1.2.1.6 Submittals;
10.1.1.2.1.7 Bonds and insurance;
10.1.1.2.1.8 Close-out/Certification documentation;
10.1.1.2.1.9 Demolition;
10.1.1.2.1.10 Installation;
10.1.1.2.1.11 Rough-in;
10.1.1.2.1.12 Finishes;
10.1.1.2.1.13 Testing;
10.1.1.2.1.14 Punchlist and District acceptance.

10.1.1.2.2 And also divided by each of the following areas:

10.1.1.2.2.1 Site work;

10.1.1.2.2.2 By each building;
10.1.1.2.2.3 By each floor.

10.1.1.2.3 The preliminary schedule of values shall not provide for values any greater than the following percentages of the Contract value:

10.1.1.2.3.1 Mobilization and layout combined to equal not more than 1%;
10.1.1.2.3.2 Submittals, samples and shop drawings combined to equal not more than 3%;
10.1.1.2.3.3 Bonds and insurance combined to equal not more than 2.5%.
10.1.1.2.3.4 Closeout documentation shall have a value in the preliminary schedule of not less than 3%.

10.1.1.2.4 Notwithstanding any provision of the Contract Documents to the contrary, payment of the Contractor's overhead, supervision, general conditions costs, and profit, as reflected in the Cost Breakdown, shall be paid based on percentage complete, with the disbursement of Progress Payments and the Final Payment.

10.1.1.2.5 Contractor shall certify that the preliminary schedule of values as submitted to the District is accurate and reflects the costs as developed in preparing Contractor's bid. For example, without limiting the foregoing, Contractor shall not "front-load" the preliminary schedule of values with dollar amounts greater than the value of activities performed early in the Project.

10.1.1.2.6 The preliminary schedule of values shall be subject to the District's review and approval of the form and content thereof. In the event that the District objects to any portion of the preliminary schedule of values, the District shall notify the Contractor, in writing, of the District's objection(s) to the preliminary schedule of values. Within five (5) calendar days of the date of the District's written objection(s), Contractor shall submit a revised preliminary schedule of values to the District for review and approval. The foregoing procedure for the preparation, review and approval of the preliminary schedule of values shall continue until the District has approved the entirety of the preliminary schedule of values.

10.1.1.2.7 Once the preliminary schedule of values is approved by the District, this shall become the Schedule of Values. The Schedule of Values 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 discretion of the District.

10.1.1.3 Preliminary Schedule of Submittals. A preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals. Once approved by District, this shall become the Submittal Schedule. All submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those submittals shall be forwarded to the

District so as not to delay the Construction Schedule. Upon request by the District, Contractor shall provide an electronic copy of all submittals to the District. All submittals shall be submitted no later than 90 days after the Notice to Proceed.

10.1.1.4 Safety Plan. Contractor's Safety Plan specifically adapted for the Project. Contractor's Safety Plan shall comply with the following requirements:

10.1.1.4.1 All applicable requirements of California Division of Occupational Safety and Health ("CalOSHA") and/or of the United States Occupational Safety and Health Administration ("OSHA").

10.1.1.4.2 All provisions regarding Project safety, including all applicable provisions in these General Conditions.

10.1.1.4.3 Contractor's Safety Plan shall be in English and in the language(s) of the Contractor's and its Subcontractors' employees.

10.1.1.5 Update Registered Subcontractors List. The name, address, telephone number, facsimile number, California State Contractors License number, classification, DIR registration number and monetary value of all Subcontracts of any tier for parties furnishing labor, material, or equipment for completion of the Project.

10.1.2 Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project or Primavera) approved in advance by the District.

10.1.3 The District will review the schedules submitted and the Contractor shall make changes and corrections in the schedules as requested by the District and resubmit the schedules until approved by the District.

10.1.4 The District shall have the right at any time to revise the schedule of values if, in the District's sole opinion, the schedule of values does not accurately reflect the value of the Work performed.

10.1.5 All schedules must be approved by the District before Contractor can rely on them as a basis for payment.

10.2 Monthly Progress Schedule(s)

10.2.1 Contractor shall provide Monthly Progress Schedule(s) to the District. A Monthly Progress Schedule shall update the approved Construction Schedule or the last Monthly Progress Schedule, showing all work completed and to be completed as well as updating the Registered Subcontractors List. The monthly Progress Schedule shall be sent within the timeframe requested by the District and shall be in a format acceptable to the District and contain a written narrative of the progress of work that month and any changes, delays, or events that may affect the work. The process for District approval of the Monthly Progress Schedule shall be the same as the process for approval of the Construction Schedule.

10.2.2 Contractor shall submit Monthly Progress Schedule(s) with all payment applications.

10.2.3 Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project or Primavera) approved in advance by the District.

10.2.4 The District will review the schedules submitted and the Contractor shall make changes and corrections in the schedules as requested by the District and resubmit the schedules until approved by the District.

10.2.5 The District shall have the right at any time to revise the schedule of values if, in the District's sole opinion, the schedule of values does not accurately reflect the value of the Work performed.

10.2.6 All schedules must be approved by the District before Contractor can rely on them as a basis for payment.

10.3 Material Safety Data Sheets (MSDS)

Contractor is required to ensure Material Safety Data Sheets are available in a readily accessible place at the Site for any material requiring a Material Safety Data Sheet per the federal "Hazard Communication" standard, or employees' "right to know" law. The Contractor is also required to ensure proper labeling on substances brought onto the job site and that any person working with the material or within the general area of the material is informed of the hazards of the substance and follows proper handling and protection procedures. Two additional copies of the Material Safety Data Sheets shall also be submitted directly to the District.

10.4 Submittals

10.4.1 Architect's favorable review shall neither be construed as a complete check nor relieve the Contractor, Subcontractor, manufacturer, fabricator, or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract Documents unless the Contractor has, in writing, called Architect's attention to the deviations at the time of submission and the Architect has given specific written response. "Favorable review" shall mean merely that Architect has no objection to Contractor using, upon Contractor's own full responsibility, plan or method of Work proposed, or furnishing materials or equipment proposed.

11. SITE ACCESS, CONDITIONS, AND REQUIREMENTS

11.1 Site Investigation

Before bidding on this Work, Contractor shall make a careful investigation of the Site and thoroughly familiarize itself with the requirements of the Contract. By the act of submitting a bid for the Work included in this Contract, Contractor shall be deemed to have made a complete study and investigation, and to be familiar with and accepted the existing conditions of the Site.

Prior to commencing the Work, Contractor and the District's representative shall survey the Site to document the condition of the Site. Contractor will record the survey in digital videotape format and provide an electronic copy to the District within fourteen (14) days of the survey. This electronic record shall serve as a basis for determining any damages caused by the Contractor during the Project. The Contractor may also document any pre-existing conditions in writing, provided that both the Contractor and the District's representative agree on said conditions and sign a memorandum documenting the same.

11.2 Soils Investigation Report

11.2.1 When a soils investigation report obtained from test holes at Site or for the Project is available, that report may be available to the Contractor but shall not be a part of this Contract and shall not alleviate or excuse the Contractor's obligation to perform its own investigation. Any information obtained from that report or any information given on Drawings as to subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only, is not guaranteed, does not form a part of this Contract, and Contractor may not rely thereon. By submitting its bid, Contractor acknowledges that it has made visual examination of Site and has made whatever tests Contractor deems appropriate to determine underground condition of soil. Although any such report is not a part of this Contract, recommendations from the report may be included in the Drawings, Specifications, or other Contract Documents. It is Contractor's sole responsibility to thoroughly review all Contract Documents, Drawings, and Specifications.

11.2.2 Contractor agrees that no claim against District will be made by Contractor for damages and hereby waives any rights to damages if, during progress of Work, Contractor encounters subsurface or latent conditions at Site materially differing from those shown on Drawings or indicated in Specifications, or for unknown conditions of an unusual nature that differ materially from those ordinarily encountered in the work of the character provided for in Plans and Specifications, except as indicated in the provisions of these General Conditions regarding trenches, trenching, and/or existing utility lines.

11.3 Access to Work

District and its representatives shall at all times have access to Work wherever it is in preparation or progress, including storage and fabrication. Contractor shall provide safe and proper facilities for such access so that District's representatives may perform their functions.

11.4 Layout and Field Engineering

11.4.1 All field engineering required for layout of this Work and establishing grades for earthwork operations shall be furnished by Contractor at its expense. This Work shall be done by a qualified, California-registered civil engineer approved in writing by District and Architect. Any required Record and/or As-Built Drawings of Site development shall be prepared by the approved civil engineer.

11.4.2 The Contractor shall be responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the Site and for having satisfied itself as to the conditions under which the Work is to be performed. Contractor shall follow best practices, including but not limited to potholing to avoid utilities. District shall not be liable for any claim for allowances because of Contractor's error, failure to follow best practices, or negligence in acquainting itself with the conditions at the Site.

11.4.3 Contractor shall protect and preserve established benchmarks and monuments and shall make no changes in locations without the prior written approval of District. Contractor shall replace any benchmarks or monuments that are lost or destroyed subsequent to proper notification of District and with District's approval.

11.5 Utilities

Utilities shall be provided as indicated in the Specifications.

11.6 Sanitary Facilities

Sanitary facilities shall be provided as indicated in the Specifications.

11.7 Surveys

Contractor shall provide surveys done by a California-licensed civil engineer surveyor to determine locations of construction, grading, and site work as required to perform the Work.

11.8 Regional Notification Center

The Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area or in a private easement that is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the District, and obtain an inquiry identification number from that notification center. No excavation shall be commenced and/or carried out by the Contractor unless an inquiry identification number has been assigned to the Contractor or any Subcontractor and the Contractor has given the District the identification number. Any damages arising from Contractor's failure to make appropriate notification shall be at the sole risk and expense of the Contractor. Any delays caused by failure to make appropriate notification shall be at the sole risk of the Contractor and shall not be considered for an extension of the Contract Time.

11.9 Existing Utility Lines

11.9.1 Pursuant to Government Code section 4215, District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction Site at the time of commencement of construction under this Contract with respect to any such utility facilities that are not identified in the Plans and Specifications. Contractor shall not be assessed for

liquidated damages for delay in completion of the Project caused by failure of District or the owner of a utility to provide for removal or relocation of such utility facilities.

11.9.2 Locations of existing utilities provided by District shall not be considered exact but approximate within a reasonable margin and shall not relieve Contractor of responsibilities to exercise reasonable care or costs of repair due to Contractor's failure to do so. District shall compensate Contractor for the costs of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans and Specifications with reasonable accuracy, and for equipment necessarily idle during such work.

11.9.3 No provision herein shall be construed to preclude assessment against Contractor for any other delays in completion of the Work. Nothing in this Article shall be deemed to require District to indicate the presence of existing service laterals, appurtenances, or other utility lines, within the exception of main or trunk utility lines or whenever the presence of these utilities on the Site of the construction Project can be inferred from the presence of other visible facilities, such as buildings, meter junction boxes, on or adjacent to the Site of the construction.

11.9.4 If Contractor, while performing Work under this Contract, discovers utility facilities not identified by District in Contract Plans and Specifications, Contractor shall immediately notify the District and the utility in writing. The cost of repair for damage to above-mentioned discovered facilities without prior written notification to the District shall be borne by the Contractor.

11.10 Notification

Contractor understands, acknowledges and agrees that the purpose for prompt notification to the District pursuant to these provisions is to allow the District to investigate the condition(s) so that the District shall have the opportunity to decide how the District desires to proceed as a result of the condition(s). Accordingly, failure of Contractor to promptly notify the District in writing, pursuant to these provisions, shall constitute Contractor's waiver of any claim for damages or delay incurred as a result of the condition(s).

11.11 Hazardous Materials

Contractor shall comply with all provisions and requirements of the Contract Documents related to hazardous materials including, without limitation, Hazardous Materials Procedures and Requirements.

11.12 No Signs

Neither the Contractor nor any other person or entity shall display any signs not required by law or the Contract Documents at the Site, fences trailers, offices, or elsewhere on the Site without specific prior written approval of the District.

12. TRENCHES

12.1 Trenches Greater Than Five Feet

Pursuant to Labor Code section 6705, if the Contract Price exceeds $25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of excavation, promptly submit to the District and/or a registered civil or structural engineer employed by the District or Architect, a detailed plan, stamped by a licensed engineer retained by the Contractor, showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

12.2 Excavation Safety

If such plan varies from the Shoring System Standards established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer, but in no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by the District or by the person to whom authority to accept has been delegated by the District.

12.3 No Tort Liability of District

Pursuant to Labor Code section 6705, nothing in this Article shall impose tort liability upon the District or any of its employees.

12.4 No Excavation without Permits

The Contractor shall not commence any excavation Work until it has secured all necessary permits including the required CalOSHA excavation/shoring permit. Any permits shall be prominently displayed on the Site prior to the commencement of any excavation.

12.5 Discovery of Hazardous Waste and/or Unusual Conditions

12.5.1 Pursuant to Public Contract Code section 7104, if the Work 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, in writing, of any:

12.5.1.1 Material that the Contractor believes may be material that is hazardous waste, as defined in section 25117 of the Health and Safety Code, is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

12.5.1.2 Subsurface or latent physical conditions at the Site differing from those indicated.

12.5.1.3 Unknown physical conditions at the Site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

12.5.2 The District shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, shall issue a Change Order under the procedures described herein.

12.5.3 In the event that a dispute arises between District and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law that pertain to the resolution of disputes and protests.

13. INSURANCE AND BONDS

13.1 Insurance

Unless different provisions and/or limits are indicated in the Special Conditions, all insurance required of Contractor and/or its Subcontractor(s) shall be at least as broad as the amounts and include the provisions set forth herein.

13.1.1 Commercial General Liability and Automobile Liability Insurance

13.1.1.1 Contractor shall procure and maintain, during the life of this Contract, Commercial General Liability Insurance and Automobile Liability Insurance in a form at least as broad as Insurance Services (ISO) Form CG 00 01 that shall protect Contractor, its agents, representative, employees, or subcontractors, District, State, Construction Manager(s), Project Inspector(s), and Architect(s) from all claims for products and completed operations, property damage, bodily injury and personal injury, death, advertising injury, and medical payments arising from, or in connection with, the performance of the Work of the Project within the Contract Documents at the required limits, or Contractor shall procure and maintain these coverages separately. Contractor shall procure and maintain Automobile Liability Insurance in a form at least as broad as ISO Form CA 0001 covering Code 1 (any auto) at the required limits, or Contractor shall procure and maintain these coverages separately.

13.1.1.2 Contractor's deductible or self-insured retention for its Commercial General Liability Insurance policy shall not exceed five thousand dollars ($5,000) for deductible or twenty-five thousand dollars ($25,000) for self-insured retention, respectively, unless approved in writing by District.

13.1.1.3 All such policies shall be written on an occurrence form.

13.1.2 Excess Liability Insurance

13.1.2.1 If Contractor's underlying policy limits are less than required, subject to the District's sole discretion, Contractor may procure and maintain, during the life of this Contract, an Excess Liability Insurance Policy to meet the policy limit requirements of the required policies in order to satisfy, in the aggregate with its underlying policy, the insurance requirements herein including, but not limited to, primary and non-contributory, additional insured, Self-Insured Retentions (SIRs), indemnity, and defense requirements. The Excess Liability Insurance Policy shall be provided on a true "following form" or broader coverage basis, with coverage at least as broad as provided on the underlying Commercial General Liability insurance. No insurance policies maintained by the Additional Insureds, whether primary or excess, and which also apply to a loss covered hereunder, shall be called upon to contribute to a loss until Contractor's primary and excess liability policies are exhausted.

13.1.2.2 There shall be no gap between the per occurrence amount of any underlying policy and the start of the coverage under the Excess Liability Insurance Policy. Any Excess Liability Insurance Policy shall be written on a following form and shall protect Contractor, District, State, Construction Manager(s), Project Manager(s), and Architect(s) in amounts and including the provisions as set forth in the Supplementary Conditions (if any) and/or Special Conditions, and that complies with all requirements for Commercial General Liability and Automobile Liability and Employers' Liability Insurance.

13.1.2.3 The District, in its sole discretion, may accept the Excess Liability Insurance Policy that brings Contractor's primary limits to the minimum requirements herein.

13.1.3 Subcontractor(s): Contractor shall require its Subcontractor(s), if any, to procure and maintain Commercial General Liability Insurance, Automobile Liability Insurance, and Excess Liability Insurance (if Subcontractor elects to satisfy, in part the insurance required herein by procuring and maintaining an Excess Liability Insurance Policy) with minimum limits at least equal to the amount required of Contractor except where smaller minimum limits are permitted as set forth below. For Commercial General Liability coverage, subcontractors shall provide coverage with a form at least as broad as CG 20 38 04 13.

13.1.4 Workers' Compensation and Employers' Liability Insurance

13.1.4.1 In accordance with provisions of section 3700 of the California Labor Code, the Contractor and every Subcontractor shall be required to secure the payment of compensation to its employees.

13.1.4.2 Contractor shall procure and maintain, during the life of this Contract, Workers' Compensation Insurance and Employers' Liability Insurance for all of its employees engaged in work under this Contract, on/or at the Site of the Project. This coverage shall cover, at a minimum, medical and surgical treatment, disability benefits, rehabilitation therapy, and survivors' death benefits. Contractor shall require its Subcontractor(s), if any, to procure and maintain

Workers' Compensation Insurance and Employers' Liability Insurance for all employees of Subcontractor(s). Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by Contractor's insurance. If any class of employee or employee engaged in Work under this Contract, on or at the Site of the Project, is not protected under the Workers' Compensation Insurance, Contractor shall provide, or shall cause a Subcontractor to provide, adequate insurance coverage for the protection of any employee(s) not otherwise protected before any of those employee(s) commence work.

13.1.4.3 The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of District for all work performed by Contractor, its employees, agents and subcontractors.

13.1.5 Builder's Risk Insurance: Builder's Risk "All Risk" Insurance

Contractor shall procure and maintain, during the life of this Contract, Builder's Risk (Course of Construction) insurance utilizing an "All Risk" (Special Perils) coverage form, with limits equal to the completed value of the Project and no coinsurance penalty provisions. The cost value basis shall be consistent with the total replacement cost of all insurable Work of the Project included within the Contract Documents. Coverage is to insure against all risks of accidental physical loss and shall include without limitation the perils of vandalism and/or malicious mischief (both without any limitation regarding vacancy or occupancy), sprinkler leakage, civil authority, theft, sonic disturbance, earthquake, flood, collapse, wind, rain, dust, fire, war, terrorism, lightning, smoke, and rioting. Coverage shall include debris removal, demolition, increased costs due to enforcement of all applicable ordinances and/or laws in the repair and replacement of damaged and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project, including completed Work and Work in progress, to the full insurable value thereof.

13.1.6 Pollution Liability Insurance

13.1.6.1 Contractor shall procure and maintain Pollution Liability Insurance in a form at least as broad as ISO Form CG 2415 that shall protect Contractor, District, State, Construction Manager(s), Project Inspector(s), and Architect(s) from all claims for bodily injury, property damage, including natural resource damage, cleanup costs, removal, storage, disposal, and/or use of the pollutant arising from operations under this Contract, and defense, including costs and expenses incurred in the investigation, defense, or settlement of claims, or Contractor shall procure and maintain these coverages separately. Coverage shall apply to sudden and/or gradual pollution conditions resulting from the escape or release of smoke, vapors, fumes, acids, alkalis, toxic chemicals, liquids, or gases, natural gas, waste materials, or other irritants, contaminants, or pollutants, including asbestos.

13.1.6.2 Contractor warrants that any retroactive date applicable to coverage under the policy shall predate the effective date of the Contract and that continuous coverage will be maintained or an extended reporting or discovery

period will be exercised for a period of three (3) years, beginning from the time that the Work under the Contract is completed.

13.1.6.3 If the services involve lead-based paint or asbestos identification/ remediation, Contractor's Pollution Liability policy shall not contain lead-based paint or asbestos exclusions. If the services involve mold identification/ remediation, Contractor's Pollution Liability policy shall not contain a mold exclusion, and the definition of Pollution shall include microbial matter, including mold.

13.1.6.4 If Contractor is responsible for removing any pollutants from a site, then Contractor shall ensure that Any Auto, including owned, non-owned, and hired, is included within the above policies and at the required limits, to cover its automobile exposure from transporting the pollutants from the site to an approved disposal site. This coverage shall include the Motor Carrier Act Endorsement, MCS 90.

13.1.7 Proof of Insurance and Other Requirements: Endorsements and Certificates

13.1.7.1 Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under this Contract, until Contractor and its Subcontractor(s) have procured all required insurance and Contractor has delivered in duplicate to the District complete endorsements (or entire insurance policies) and certificates indicating the required coverages have been obtained, and the District has approved these documents.

13.1.7.2 Endorsements, certificates, and insurance policies shall include the following:

13.1.7.2.1 A clause stating the following, or other language acceptable to the District:

"This policy shall not be canceled until written notice to District, Architect, and Construction Manager stating date of the cancellation by the insurance carrier. Date of cancellation may not be less than thirty (30) days after date of mailing notice."

13.1.7.2.2 Language stating in particular those insured, extent of insurance, location and operation to which insurance applies, expiration date, to whom cancellation and reduction notice will be sent, and length of notice period.

13.1.7.2.3 All endorsements, certificates and insurance policies shall state that District, its trustees, employees and agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s) and Architect(s) are named additional insureds under all policies except Workers' Compensation Insurance and Employers' Liability Insurance. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance (at least as broad as ISO Form CG 20 10, CG 11 85 or **both** CG 20

10, CG 20 26, CG 20 33, or CG 20 38; **and** CG 20 37 forms if later revisions used).

13.1.7.2.4 All endorsements shall waive any right to subrogation against any of the named additional insureds.

13.1.7.2.5 Contractor's and Subcontractors' insurance coverage at least as broad as ISO CG 20 01 04 13 shall be primary and non-contributory to any insurance or self-insurance maintained by District, its trustees, employees and/or agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s), and/or Architect(s). This requirement shall also apply to any Excess liability policies.

13.1.7.2.6 Contractor's insurance limit shall apply separately to each insured against whom a claim is made or suit is brought.

13.1.7.3 No policy shall be amended, canceled or modified, and the coverage amounts shall not be reduced, until Contractor or Contractor's broker has provided written notice to District, Architect(s), and Construction Manager(s) stating date of the amendment, modification, cancellation or reduction, and a description of the change. Date of amendment, modification, cancellation or reduction may not be less than thirty (30) days after date of mailing notice.

13.1.7.4 Insurance written on a "claims made" basis shall be retroactive to a date that coincides with or precedes Contractor's commencement of Work, including subsequent policies purchased as renewals or replacements. Said policy is to be renewed by the Contractor and all Subcontractors for a period of five (5) years following completion of the Work or termination of this Agreement. Such insurance must have the same coverage and limits as the policy that was in effect during the term of this Agreement and will cover the Contractor and all Subcontractors for all claims made. If coverage is cancelled or non-renewed, and not replaced with another claims-made policy from with a retroactive date prior to the effective date of this Agreement, or the start of Work date, the Contractor must purchase extended reporting period coverage for a minimum of five (5) years after completion of contract work. A copy of the claims reporting requirements must be submitted to the District for review.

13.1.7.5 Contractor's and Subcontractors' insurance policy(s) shall be primary and non-contributory to any insurance or self-insurance maintained by District, its Board Members, employees and/or agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s), and/or Architect(s).

13.1.7.6 Unless otherwise stated in the Special Conditions, all of Contractor's insurance shall be with insurance companies with an A.M. Best rating of no less than **A: VII**.

13.1.7.7 The insurance requirements set forth herein shall in no way limit the Contractor's liability arising out of or relating to the performance of the Work or related activities.

13.1.7.8 Failure of Contractor and/or its Subcontractor(s) to comply with the insurance requirements herein shall be deemed a material breach of the Contract.

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13.1.8 Insurance Policy Limits

13.1.8.1 Unless different limits are indicated in the Special Conditions, the limits of insurance shall not be less than the following amounts:

Commercial General Liability	Product Liability and Completed Operations, Fire Damage Liability – Split Limit	$2,000,000 per occurrence; $4,000,000 aggregate
Automobile Liability	Any Auto – Combined Single Limit	$1,000,000
Workers' Compensation		Statutory limits pursuant to State law
Employers' Liability		$1,000,000 per accident for bodily injury or disease
Builder's Risk (Course of Construction)		Full replacement value for scope of Work
Pollution Liability		$1,000,000 per claim; $2,000,000 aggregate

13.1.8.2 If Contractor normally carries insurance in an amount greater than the minimum amounts required by District, that greater amount shall become the minimum required amount of insurance for purposes of the Contract. Therefore, Contractor hereby acknowledges and agrees that all insurance carried by it shall be deemed liability coverage for all actions it performs in connection with the Contract.

13.2 Contract Security - Bonds

13.2.1 Contractor shall furnish two surety bonds issued by a California admitted surety insurer as follows:

13.2.1.1 Performance Bond: A bond in an amount at least equal to one hundred percent (100%) of Contract Price as security for faithful performance of this Contract.

13.2.1.2 Payment Bond: A bond in an amount at least equal to one hundred percent (100%) of the Contract Price as security for payment of persons performing labor and/or furnishing materials in connection with this Contract.

13.2.2 Cost of bonds shall be included in the Bid and Contract Price.

13.2.3 All bonds related to this Project shall be in the forms set forth in these Contract Documents and shall comply with all requirements of the Contract Documents, including, without limitation, the bond forms.

14. WARRANTY/GUARANTEE/INDEMNITY

14.1 Warranty/Guarantee

14.1.1 The Contractor shall obtain and preserve for the benefit of the District, manufacturer's warranties on materials, fixtures, and equipment incorporated into the Work.

14.1.2 In addition to guarantees required elsewhere, Contractor shall, and hereby does guarantee and warrant all Work furnished on the job against all defects for a period of **ONE (1)** year after the later of the following dates, unless a longer period is provided for in the Contract Documents:

14.1.2.1 The acceptance by the District's governing board of the Work, subject to these General Conditions, or

14.1.2.2 The date that commissioning for the Project, if any, was completed.

At the District's sole option, Contractor shall repair or replace any and all of that Work, together with any other Work that may be displaced in so doing, that may prove defective in workmanship and/or materials within a **ONE (1)** year period from date of completion as defined above, unless a longer period is provided for in the Contract Documents, without expense whatsoever to District. In the event of failure of Contractor and/or Surety to commence and pursue with diligence said replacements or repairs within ten (10) days after being notified in writing, Contractor and Surety hereby acknowledge and agree that District is authorized to proceed to have defects repaired and made good at expense of Contractor and/or Surety who hereby agree to pay costs and charges therefore immediately on demand.

14.1.3 If, in the opinion of District, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to District or to prevent interruption of District operations, District will attempt to give the notice required above. If Contractor or Surety cannot be contacted or neither complies with District's request for correction within a reasonable time as determined by District, District may, notwithstanding the above provision, proceed to make any and all corrections and/or provide attentions the District believes are necessary. The costs of correction or attention shall be charged against Contractor and Surety of the guarantees provided in this Article or elsewhere in this Contract.

14.1.4 The above provisions do not in any way limit the guarantees on any items for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish to District all appropriate guarantee or warranty certificates as indicated in the Specifications or upon request by District.

14.1.5 Nothing herein shall limit any other rights or remedies available to District.

14.2 Indemnity and Defense

14.2.1 To the furthest extent permitted by California law, the Contractor shall indemnify, keep and hold harmless the District, the Architect(s), and the Construction Manager(s), their respective consultants, separate contractors, board members, officers, representatives, agents, and employees, in both individual and official capacities ("Indemnitees"), against all suits, claims, injury, damages, losses, and expenses ("Claims"), including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to the performance of the Work under this Contract by the Contractor, its Subcontractors, vendors, or suppliers. However, the Contractor's indemnification and hold harmless obligation shall be reduced by the proportion of the Indemnitees' and/or Architect's liability to the extent the Claim(s) is/are caused by the active negligence or willful misconduct of the Indemnitees, and/or defects in design furnished by the Architect, as found by a court or arbitrator of competent jurisdiction. This indemnification and hold harmless obligation of the Contractor shall not be construed to negate, abridge, or otherwise reduce any right or obligation of indemnity that would otherwise exist or arise as to any Indemnitee or other person described herein. This indemnification and hold harmless obligation includes, but is not limited to, any failure or alleged failure by Contractor to comply with any provision of law, any failure or alleged failure to timely and properly fulfill all of its obligations under the Contract Documents in strict accordance with their terms, and without limitation, any failure or alleged failure of Contractor's obligations regarding any stop payment notice actions or liens, including Civil Wage and Penalty Assessments and/or Orders by the DIR.

14.2.2 To the furthest extent permitted by California law, Contractor shall also defend Indemnitees, at its own expense, including but not limited to attorneys' fees and costs, against all Claims caused by, arising out of, resulting from, or incidental to the performance of the Work under this Contract by the Contractor, its Subcontractors, vendors, or suppliers. However, without impacting Contractor's obligation to provide an immediate and ongoing defense of Indemnitees, the Contractor's defense obligation shall be retroactively reduced by the proportion of the Indemnitees' and/or Architect's liability to the extent caused by the active negligence or willful misconduct of the Indemnitees, and/or defects in design furnished by the Architect, as found by a court or arbitrator of competent jurisdiction. The District shall have the right to accept or reject any legal representation that Contractor proposes to defend the Indemnitees. If a conflict-of-interest bars joint representation of Contractor and Indemnitees, District shall have the right to select its own counsel, subject to Contractor's reasonable right of rejection. If any Indemnitee provides its own defense due to failure to timely respond to tender of defense, rejection of tender of defense, or conflict of interest of proposed counsel, Contractor shall reimburse such Indemnitee for any expenditures.

Even if the Contractor assumes the defense of the District with acceptable counsel, the District, at its sole option, may participate in the defense, at its own expense, with counsel of its own choice without relieving the Contractor of any of its obligations hereunder. Contractor's defense obligation shall not be construed to negate, abridge, or otherwise reduce any right or obligation of defense that would otherwise exist as to any Indemnitee or other person described herein. Contractor's defense obligation includes, but is not limited to, any failure or alleged failure by Contractor to comply with any provision of law, any failure or alleged failure to timely and properly fulfill all of its obligations under the Contract Documents in strict accordance with their terms, and without limitation, any failure or alleged failure of Contractor's obligations regarding any stop payment notice actions or liens, including Civil Wage and Penalty Assessments and/or Orders by the DIR. The Contractor shall give prompt notice to the District in the event of any Claim(s).

14.2.3 Without limitation of the provisions herein, if the Contractor's obligation to indemnify and hold harmless the Indemnitees or its obligation to defend Indemnitees as provided herein shall be determined to be void or unenforceable, in whole or in part, it is the intention of the parties that these circumstances shall not otherwise affect the validity or enforceability of the Contractor's agreement to indemnify, defend, and hold harmless the rest of the Indemnitees, as provided herein. Further, the Contractor shall be and remain fully liable on its agreements and obligations herein to the fullest extent permitted by law.

14.2.4 Pursuant to Public Contract Code section 9201, the District shall provide timely notification to Contractor of the receipt of any third-party Claim relating to this Contract. The District shall be entitled to recover its reasonable costs incurred in providing said notification.

14.2.5 In any and all Claims against any of the Indemnitees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the Contractor's indemnification obligation herein shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

14.2.6 The District may retain so much of the moneys due the Contractor as shall be considered necessary, until disposition of any such Claims or until the District, Architect(s) and Construction Manager(s) have received written agreement from the Contractor that they will unconditionally defend the District, Architect(s) and Construction Manager(s), their respective officers, agents and employees, and pay any damages due by reason of settlement or judgment.

14.2.7 The Contractor's defense and indemnification obligations hereunder shall survive the completion of Work, the warranty/guarantee period, and the termination of the Contract.

15. TIME

15.1 Notice to Proceed

15.1.1 District may issue a Notice to Proceed within ninety (90) days from the date of the Notice of Award. Once Contractor has received the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents.

15.1.2 In the event that the District desires to postpone issuing the Notice to Proceed beyond ninety (90) days from the date of the Notice of Award, it is expressly understood that with reasonable notice to the Contractor, the District may postpone issuing the Notice to Proceed. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed.

15.1.3 If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to Contractor, Contractor may terminate the Contract. Contractor's termination due to a postponement shall be by written notice to District within ten (10) days after receipt by Contractor of District's notice of postponement. It is further understood by Contractor that in the event that Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement. Should Contractor terminate the Contract as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible bidder.

15.2 Computation of Time / Adverse Weather

15.2.1 The Contractor will only be allowed a time extension for Adverse Weather conditions if requested by Contractor in compliance with the time extension request procedures and only if all of the following conditions are met:

15.2.1.1 The weather conditions constitute Adverse Weather, as defined herein;

15.2.1.2 Contractor can verify that the Adverse Weather caused delays in excess of five (5) hours of the indicated labor required to complete the scheduled tasks of Work on the day affected by the Adverse Weather;

15.2.1.3 The Contractor's crew is dismissed as a result of the Adverse Weather;

15.2.1.4 Said delay adversely affects the critical path in the Construction Schedule; and

15.2.1.5 Exceeds twelve (12) days of delay per year.

15.2.2 If the aforementioned conditions are met, a non-compensable day-for-day extension will only be allowed for those days in excess of those indicated herein.

15.2.3 The Contractor shall work seven (7) days per week, if necessary, irrespective of inclement weather, to maintain access and the Construction Schedule, and to protect the Work under construction from the effects of Adverse Weather, all at no further cost to the District.

15.2.4 The Contract Time has been determined with consideration given to the average climate weather conditions prevailing in the County in which the Project is located.

15.3 Hours of Work

15.3.1 Sufficient Forces

Contractor and Subcontractors shall continuously furnish sufficient and competent work forces with the required levels of familiarity with the Project and skill, training and experience to ensure the prosecution of the Work in accordance with the Construction Schedule.

15.3.2 Performance During Working Hours

Work shall be performed during regular working hours as permitted by the appropriate governmental agency except that in the event of an emergency, or when required to complete the Work in accordance with job progress, Work may be performed outside of regular working hours with the advance written consent of the District and approval of any required governmental agencies.

15.3.3 No Work during State Testing

Contractor shall, at no additional cost to the District and at the District's request, coordinate its Work to not disturb District students including, without limitation, not performing any Work when students at the Site are taking State or Federally-required tests. The District or District's Representative will provide Contractor with a schedule of test dates concurrent with the District's issuance of the Notice to Proceed, or as soon as test dates are made available to the District.

15.4 Progress and Completion

15.4.1 Time of the Essence

Time limits stated in the Contract Documents are of the essence to the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

15.4.2 No Commencement Without Insurance or Bonds

The Contractor shall not commence operations on the Project or elsewhere prior to the effective date of insurance and bonds. The date of commencement of the Work shall not be changed by the effective date of such insurance or bonds. If Contractor commences Work without insurance and bonds, all Work is performed at Contractor's peril and shall not be compensable until and unless Contractor secures bonds and

insurance pursuant to the terms of the Contract Documents and subject to District claim for damages.

15.5 Schedule

Contractor shall provide to District, Construction Manager, and Architect a schedule in conformance with the Contract Documents and as required in the Notice to Proceed and the Contractor's Submittals and Schedules section of these General Conditions.

15.6 Expeditious Completion

The Contractor shall proceed expeditiously with adequate forces and shall achieve Completion within the Contract Time.

16. EXTENSIONS OF TIME – LIQUIDATED DAMAGES

16.1 Liquidated Damages

Contractor and District hereby agree that the exact amount of damages for failure to complete the Work within the time specified is extremely difficult or impossible to determine. If the Work is not completed within the time specified in the Contract Documents, it is understood that the District will suffer damage. It being impractical and unfeasible to determine the amount of actual damage, it is agreed the Contractor shall pay to District as fixed and liquidated damages, and not as a penalty, the amount set forth in the Agreement for each calendar day of delay in completion. Contractor and its Surety shall be liable for the amount thereof pursuant to Government Code section 53069.85.

16.2 Excusable Delay

16.2.1 Contractor shall not be charged for liquidated damages because of any delays in completion of the Work which are not the fault of Contractor or its Subcontractors, including adverse weather delays, strikes, acts of God as defined in Public Contract Code section 7105, acts of enemy, epidemics, and quarantine restrictions. Contractor shall, within five (5) calendar days of beginning of any delay, including a Force Majeure event, notify District in writing of causes of delay including documentation and facts explaining the delay and the direct correlation between the cause and effect ("Notice of Delay"). District shall review the facts and extent of any delay and shall grant extension(s) of time for completing Work when, in its judgment, the findings of fact justify an extension. Extension(s) of time shall apply only to that portion of Work affected by delay and shall not apply to other portions of Work not so affected. An extension of time may only be granted if Contractor has timely submitted the Construction Schedule as required herein.

16.2.2 Contractor's Notice of Delay and request for a time extension pursuant to subparagraph 16.2 is a condition precedent to Contractor's submittal of and/or entitlement to a claim pursuant to Article 25 of these Construction Provisions. Contractor shall notify the District pursuant to the Claims Process provisions in these General Conditions of any anticipated delay and its cause. Following submission of a claim, the District may determine whether the delay is to be considered avoidable or

unavoidable, how long it continues, and to what extent the prosecution and completion of the Work might be delayed thereby.

16.2.3 In the event the Contractor requests an extension of Contract Time for unavoidable delay, such request shall be submitted in accordance with the provisions in the Contract Documents governing changes in Work. When requesting time, requests must be submitted with full justification and documentation. If the Contractor fails to submit justification, it waives its right to a time extension at a later date. Such justification must be based on the official Construction Schedule as updated at the time of occurrence of the delay or execution of Work related to any changes to the Scope of Work. Any claim for delay must include the following information as support, without limitation:

16.2.3.1 The duration of the activity relating to the changes in the Work and the resources (manpower, equipment, material, etc.) required to perform the activities within the stated duration.

16.2.3.2 Specific logical ties to the Contract Schedule for the proposed changes and/or delay showing the activity/activities in the Construction Schedule that are affected by the change and/or delay. In particular, Contractor must show an actual impact to the schedule, after making a good faith effort to mitigate the delay by rescheduling the work, by providing an analysis of the schedule ("Time Impact Analysis"). Such Time Impact Analysis shall describe in detail the cause and effect of the delay and the impact on the critical dates in the Project schedule and main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path. (This information must be provided for any portion of any delay of seven (7) days or more.) The Contractor shall be responsible for all costs associated with the preparation of Time Impact Analyses.

16.2.4 A recovery schedule must be submitted within twenty (20) calendar days of written notification to the District of causes of delay to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

16.2.5 Contractor must comply with requirements in subsection 16.2 for a Notice of Delay and supporting justification notwithstanding if Contractor contends the specific delay period is unknown and continuing. When submitting a Notice of Delay and supporting justification, Contractor must provide an estimated delay duration to critical path activities at the time the Notice of Delay and supporting justification is required to be submitted. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of a Notice of Delay. If Contractor contends the delaying event(s) are continuing, Contractor must update monthly the estimated delay period with supporting justification.

16.2.6 Contractor's failure to timely submit a written Notice of Delay and/or provide the justification required in subparagraph 16.2 shall constitute Contractor's waiver of any right to later submit a Proposed Change Order or pursue a Claim on the circumstances giving rise to the request, or to later pursue any additional money or time extensions in any manner related to that issue, regardless of the merits because the Contractor will not have satisfied a condition precedent or exhausted administrative remedies required to show entitlement to a Contract Time adjustment. Contractor acknowledges that these written notices and justification requirements are critically important to District's Work, Project management, and evaluating potential options and alternatives to implement mitigation efforts to reduce or eliminate additional Project costs and delays.

16.3 No Additional Compensation for Delays Within Contractor's Control

16.3.1 Contractor is aware that governmental agencies, including, without limitation, the Division of the State Architect, the Department of General Services, gas companies, electrical utility companies, water districts, and other agencies may have to approve Contractor-prepared drawings or approve a proposed installation. Accordingly, Contractor shall include in its bid, time for possible review of its drawings and for reasonable delays and damages that may be caused by such agencies. Thus, Contractor is not entitled to make a claim for damages or delays arising from the review of Contractor's drawings.

16.3.2 Contractor shall only be entitled to compensation for delay when all of the following conditions are met:

16.3.2.1 The District is responsible for the delay;

16.3.2.2 The delay is unreasonable under the circumstances involved;

16.3.2.3 The delay was not within the contemplation of the District and Contractor;

16.3.2.4 The delay could not have been avoided or mitigated by Contractor's reasonable diligence; and

16.3.2.5 Contractor timely complies with the claims procedure of the Contract Documents.

16.3.3 Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14) calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

16.3.4 Where a change in the Work extends the Contract Time, Contractor may request and recover additional, actual direct costs, provided that Contractor can demonstrate such additional costs are:

16.3.4.1 Actually incurred performing the Work;

16.3.4.2 Not compensated by the Markup allowed; and

16.3.4.3 Directly result from the extended Contract Time.

16.3.5 Contractor shall comply with all required procedures, documentation and time requirements in the Contract Documents. Contractor may not seek or recover such costs using formulas (e.g. Eichleay, labor factors). No time will be granted under this Contract for cumulative effect of changes.

16.4 Force Majeure

"Force Majeure" means any event or circumstance unknown at the time of contracting that is beyond the parties' control and makes performance of the contract impractical or impossible. The Party seeking to have its performance obligation(s) excused must demonstrate that there was such an insuperable interference occurring without the party's intervention as could not have been prevented by the exercise of prudence, diligence, and care, by providing prompt notice to the other Party, including full particulars of such event, of its inability to perform its obligations due to such event, following commencement of the claiming Party's inability to so perform its obligations. To the extent satisfying these conditions, Force Majeure events include the following: acts of God, war, civil unrest, epidemic, fire, smoke, volcanic eruption, earthquake, strike, unusually severe weather, flood, or shortage of transportation facilities, lock out, or commandeering of materials, product, plant, or facilities by the government. Force Majeure shall not be based on a Party's financial inability to perform under this Agreement unless there exists extreme and unreasonable difficulty, expense, injury, or loss involved. A Force Majeure event does not include an act of negligence or intentional wrongdoing by a Party. Any Party claiming a Force Majeure event shall use reasonable diligence to remove the condition that prevents performance and shall not be entitled to suspend performance of its obligations in any greater scope or for any longer duration than is required by the Force Majeure event. Each Party shall use its best efforts to mitigate the effects of such Force Majeure event, remedy its inability to perform, and resume full performance of its obligations hereunder. No obligation that arose before the Force Majeure event that could and should have been fully performed before such Force Majeure event is excused as a result of such Force Majeure event.

16.5 Float or Slack in the Schedule

Float or slack is the amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any of the activities in the schedule. Float or slack is not for the exclusive use of or benefit of either the District or the Contractor, but its use shall be determined solely by the District.

17. CHANGES IN THE WORK

17.1 No Changes Without Authorization

17.1.1 There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order or a written Construction Change Directive authorized by the District as herein provided. District shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the District's governing board has authorized the same and the cost thereof has been approved in writing by Change Order or Construction Change Directive in advance of the changed Work being performed. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted and approved in writing in the Change Order or Construction Change Directive. Contractor shall be responsible for any costs incurred by the District for professional services and DSA fees and/or delay to the Project Schedule, if any, for DSA to review any request for changes to the DSA approved plans and specifications for the convenience of the Contractor and/or to accommodate the Contractor's means and methods. The provisions of the Contract Documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the Drawings and Specifications.

17.1.2 Contractor shall perform immediately all work that has been authorized by a fully executed Change Order or Construction Change Directive. Contractor shall be fully responsible for any and all delays and/or expenses caused by Contractor's failure to expeditiously perform this Work.

17.1.3 Should any Change Order result in an increase in the Contract Price or extend the Contract Time, the cost of or length of extension in that Change Order shall be agreed to, in writing, by the District in advance of the Work by Contractor and shall be subject to the monetary limitations set forth in Public Contract Code section 20118.4. In the event that Contractor proceeds with any change in Work without a Change Order executed by the District or Construction Change Directive, Contractor waives any claim of additional compensation or time for that additional work. Under no circumstances shall Contractor be entitled to any claim of additional compensation or time not expressly requested by Contractor in a Proposed Change Order or approved by District in an executed Change Order.

17.1.4 A Change Order or Construction Change Directive will become effective when approved by the Board, notwithstanding that Contractor has not signed it. A Change Order or Construction Change Directive will become effective without Contractor's signature provided District indicates it as a "Unilateral Change Order". Any dispute as to the adjustment in the Contract Price or Contract Time, if any, of the Unilateral Change Order shall be resolved pursuant to the Payments and Claims Process provisions herein.

17.1.5 Contractor understands, acknowledges, and agrees that the reason for District authorization is so that District may have an opportunity to analyze the Work and decide whether the District shall proceed with the Change Order or alter the Project so that a change in Work becomes unnecessary.

17.2 Architect Authority

The Architect will have authority to order minor changes in the Work not involving any adjustment in the Contract Price, or an extension of the Contract Time, or a change that is inconsistent with the intent of the Contract Documents. These changes shall be effected by written Change Order, Construction Change Directive, by Architect's response(s) to RFI(s), or by Architect's Supplemental Instructions ("ASI").

17.3 Price Request

17.3.1 Definition of Price Request

A Price Request is a written request prepared by the Architect requesting the Contractor to submit to the District and the Architect an estimate of the effect of a proposed change in the Work on the Contract Price and the Contract Time.

17.3.2 Scope of Price Request

A Price Request shall contain adequate information, including any necessary Drawings and Specifications, to enable Contractor to provide the cost breakdowns required herein. The Contractor shall not be entitled to any additional compensation for preparing a response to a Price Request, whether ultimately accepted or not.

17.4 Change Orders

17.4.1 A Change Order is a written instrument prepared and issued by the District and/or the Architect and signed by the District (as authorized by the District's Governing Board), the Contractor, the Architect, and approved by the Project Inspector (if necessary) and DSA (if necessary), stating their agreement regarding all of the following:

17.4.1.1 A description of a change in the Work;

17.4.1.2 The amount of the adjustment in the Contract Price, if any; and

17.4.1.3 The extent of the adjustment in the Contract Time, if any.

17.5 Proposed Change Order

17.5.1 Definition of Proposed Change Order

A Proposed Change Order ("PCO") is a written request prepared by the Contractor requesting that the District and the Architect issue a Change Order based upon a proposed change to the Work.

17.5.2 Changes in Contract Price

A PCO shall include breakdowns and backup documentation pursuant to the revisions herein and sufficient, in the District's judgment, to validate any change in Contract

Price. In no case shall Contractor or any of its Subcontractors be permitted to reserve rights for additional compensation for Change Order Work.

17.5.3 Changes in Time

A PCO shall also include any changes in time required to complete the Project. Any additional time requested shall not be the number of days to make the proposed change but must be based upon the impact to the Construction Schedule as defined in the Contract Documents. The Contractor shall justify the proposed change in time by submittal of a schedule analysis that accurately shows the impact of the change on the critical path of the Construction Schedule ("Time Impact Analysis"). If Contractor fails to request a time extension in a PCO, including the Time Impact Analysis, then the Contractor is thereafter precluded from requesting, and waives any right to request, additional time and/or claim a delay. In no case shall Contractor or any of its Subcontractors be permitted to reserve rights for additional time for Change Order Work. A PCO that leaves the amount of time requested blank, or states that such time requested is "to be determined", is not permitted and shall also constitute a waiver of any right to request additional time and/or claim a delay.

17.5.4 Allowances

If there is an Allowance, then Contractor shall not bill for or be due any portion of an Allowance unless the District has identified specific work, Contractor has submitted a price for that work or the District has proposed a price for that work, the District has accepted the cost for that work, and the District has executed an Allowance Expenditure Directive incorporating that work. Allowance Expenditure Directives shall be based on Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from the Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.

Any unused portion of the Allowance will revert to the District documented by a deductive Change Order. Contractor authorizes the District to execute a unilateral deductive Change Order at or near the end of the Project for all or any portion of the Allowance not allocated.

17.5.5 Unknown and/or Unforeseen Conditions

Separate from what is provided in the Allowance, if Contractor requests an increase in Contract Price and/or Contract Time that is based at least partially on Contractor's assertion that Contractor has encountered unknown and/or unforeseen condition(s) on the Project, then Contractor shall base the PCO on provable information that, beyond a reasonable doubt and to the District's satisfaction, demonstrates that the unknown and/or unforeseen condition(s) were actually unknown and/or unforeseen and that the condition(s) were reasonably unknown and/or unforeseen. If not, the District shall deny the PCO as unsubstantiated, and the Contractor shall complete the Project without any increase in Contract Price and/or Contract Time based on that PCO.

17.5.6 Time to Submit Proposed Change Order

Contractor shall submit its PCO, using Document 00 63 57 (Proposed Change Order Form), within five (5) working days of the date Contractor discovers, or reasonably should have discovered, the circumstances giving rise to the PCO, unless additional time to submit a PCO is granted in writing by the District. Time is of the essence in Contractor's submission of PCOs so that the District can promptly investigate the basis for the PCO. Accordingly, if Contractor fails to submit its PCO within this timeframe, Contractor waives, releases, and discharges any right to assert or claim any entitlement to an adjustment of the Contract Price and/or Time based on circumstances giving rise to the PCO.

17.5.7 Proposed Change Order Certification

In submitting a PCO, Contractor certifies and affirms that the cost and/or time request is submitted in good faith, that the cost and/or time request is accurate and in accordance with the provisions of the Contract Documents, and the Contractor submits the cost and/or request for extension of time recognizing the significant civil penalties and treble damages which follow from making a false claim or presenting a false claim under Government Code section 12650 et seq.

It is expressly understood that the value of the extra Work or changes expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project including, without limitation, cumulative impacts. Contractor is not entitled to separately recover amounts for overhead or other indirect costs. Any costs, expenses, damages, or time extensions not included are deemed waived.

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17.6 Format for Proposed Change Order

17.6.1 The following format shall be used as applicable by the District and the Contractor (e.g. Change Orders, PCO's) to communicate proposed additions and deductions to the Contract, supported by attached documentation. Any spaces left blank will be deemed no change to cost or time.

	WORK PERFORMED OTHER THAN BY CONTRACTOR	**ADD**	**DEDUCT**
(a)	**Material** (attach suppliers' invoice or itemized quantity and unit cost plus sales tax)		
(b)	**Add Labor** (attach itemized hours and rates, fully Burdened, and specify the hourly rate for each additional labor burden, for example, payroll taxes, fringe benefits, etc.)		
(c)	**Add Equipment** (attach suppliers' invoice)		
(d)	**Subtotal**		
(e)	**Add Overhead and Profit for any and all Tiers of Subcontractor**, the total not to exceed ten percent (10%) of Item (d)		
(f)	**Subtotal**		
(g)	**Add General Conditions Cost** (if Time is Compensable) (attach supporting documentation)		
(h)	**Subtotal**		
(i)	**Add Overhead and Profit for Contractor**, not to exceed five percent (5%) of Item (h)		
(j)	**Subtotal**		
(k)	**Add Bond and Insurance**, not to exceed two and one-half percent (2.5%) of Item (j)		
(l)	**TOTAL**		
(m)	**Time** (zero unless indicated; "TBD" not permitted)	**_____ Calendar Days**	

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	WORK PERFORMED BY CONTRACTOR	**ADD**	**DEDUCT**
(n)	**Material** (attach itemized quantity and unit cost plus sales tax)		
(o)	**Add Labor** (attach itemized hours and rates, fully Burdened, and specify the hourly rate for each additional labor burden, for example, payroll taxes, fringe benefits, etc.)		
(p)	**Add Equipment** (attach suppliers' invoice)		
(q)	**Add General Conditions Cost** (if Time is Compensable) (attach supporting documentation)		
(r)	**Subtotal**		
(s)	**Add Overhead and Profit for Contractor**, not to exceed fifteen percent (15%) of Item (e)		
(t)	**Subtotal**		
(u)	**Add Bond and Insurance**, not to exceed two and one-half percent (2.5%) of Item (g)		
(v)	**TOTAL**		
(w)	**Time** (zero unless indicated; "TBD" not permitted)	**_____ Calendar Days**	

17.6.2 Mandatory Use of Forms. Contractor shall only submit PCOs by completing Document 00 63 57 (Proposed Change Order Form). Contractor acknowledges and agrees that use of this specific and consistent format is essential to District's evaluation of PCOs. Accordingly, Contractor waives, releases, and discharges any right to assert or claim any entitlement to an adjustment of the Contract Price and/or Time for any purported PCO that does not comply with Document 00 63 57 (Proposed Change Order Form).

17.6.3 Labor. Contractor shall be compensated for the costs of labor actually and directly utilized in the performance of the Work. Such labor costs shall be the actual cost, use of any formulas (e.g. labor factors) is not allowed, not to exceed prevailing wage rates established by the bid advertisement date or when the Contract was awarded, whichever is applicable, in the locality of the Site and shall be in the labor classification(s) necessary for the performance of the Work, fully Burdened. Labor costs shall exclude costs incurred by the Contractor in preparing estimate(s) of the costs of the change in the Work, in the maintenance of records relating to the costs of the change in the Work, coordination and assembly of materials and information relating to the change in the Work or performance thereof, or the supervision and other overhead and general conditions costs associated with the change in the Work or performance thereof, including but not limited to the cost for the job superintendent. If applicable, District will pay Contractor the reasonable costs for room and board, supported with appropriate backup documentation, without markup for profit or overhead as provided by U.S. General Services

Administration per diem rates for California lodging, meals and incidentals, https://www.gsa.gov/travel/plan-book/per-diem-rates/per-diem-rates-lookup.

17.6.4 Materials. Contractor shall be compensated for the costs of materials necessarily and actually used or consumed in connection with the performance of the change in the Work. Costs of materials 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 the change in the Work, they shall be credited to the District. If materials necessarily used in the performance of the change in the Work 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. If, in the reasonable opinion of the District, the costs asserted by the Contractor for materials in connection with any change in the Work are excessive, or if the Contractor fails to provide satisfactory evidence of the actual costs of such materials from its supplier or vendor of the same, the costs of such materials and the District's obligation to pay for the same shall be limited to the then lowest wholesale price at which similar materials are available in the quantities required to perform the change in the Work. The District may elect to furnish materials for the change in the Work, in which event the Contractor shall not be compensated for the costs of furnishing such materials or any mark-up thereon.

17.6.5 Equipment. As a precondition to the District's duty to pay for Equipment rental or loading and transportation, Contractor shall provide satisfactory evidence of the actual costs of Equipment from the supplier, vendor or rental agency of same. Contractor shall be compensated for the actual cost of the necessary and direct use of Equipment in the performance of the change in the Work. Use of such Equipment in the performance of the change in the Work shall be compensated in increments of fifteen (15) minutes. Rental time for Equipment moved by its own power shall include time required to move such Equipment to the site of the Work from the nearest available rental source of the same. If 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 Equipment is used for performance of any portion of the Work other than the change in the Work. Unless prior approval in writing is obtained by the Contractor from the Architect, the Project 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. Contractor shall not be entitled to an allowance or any other compensation for Equipment or tools used in the performance of change in the Work where such Equipment or tools have a replacement value of $500.00 or less. Equipment costs claimed by the Contractor in connection with the performance of any Work shall not exceed rental rates 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 Project Inspector and the District, the allowable rate for the use of Equipment in connection with 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 Equipment operator), and any and all other costs incurred by the Contractor incidental to the use of such Equipment.

17.6.6 General Conditions Cost. The phrase "General Conditions Cost" shall mean, other than expressly limited or excluded herein, the costs of Contractor during the construction phase, including but not limited to: payroll costs for project manager for Work conducted at the Site, payroll costs for the superintendent and full-time general foremen, workers not included as direct labor costs engaged in support functions (e.g., loading/unloading, clean-up), costs of offices and temporary facilities including office materials, office supplies, office equipment, minor expenses, utilities, fuel, sanitary facilities and telephone services at the Site, costs of consultants not in the direct employ of Contractor or Subcontractors, and fees for permits and licenses.

17.6.7 Overhead and Profit. The phrase "Overhead and Profit" shall include field and office supervisors and assistants, watchperson, use of small tools, consumable, insurance other than construction bonds and insurance required herein, general conditions costs and home office expenses.

17.7 Change Order Certification

17.7.1 All Change Orders and PCOs include the following certification by the Contractor, either in the form specifically or incorporated by this reference:

17.7.1.1 The undersigned Contractor approves the foregoing as to the changes, if any, to the Contract Price specified for each item, and as to the extension of time allowed, if any, for completion of the entire Work as stated herein, and agrees to furnish all labor, materials, and service, and perform all work necessary to complete any additional work specified for the consideration stated herein. Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq. It is understood that the changes herein to the Contract shall only be effective when approved by the governing board of the District.

17.7.1.2 It is expressly understood that the value of the extra Work or changes expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project including, without limitation, cumulative impacts. Contractor is not entitled to separately recover amounts for overhead or other indirect costs. Any costs, expenses, damages, or time extensions not included are deemed waived.

17.7.2 Accord and Satisfaction: Contractor's execution of any Change Order shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay and any other type of claim.

17.7.3 Mandatory Use of Forms. Contractor shall only submit Change Orders by completing Document 00 63 63 (Change Order Form). Contractor acknowledges and agrees that use of this specific and consistent format is essential to District's processing of Change Orders. Accordingly, Contractor waives, releases, and discharges any right to assert or claim any entitlement to an adjustment of the Contract Price and/or Time for any change that does not comply with Document 00 63 63 (Change Order Form).

17.8 Determination of Change Order Cost

17.8.1 The amount of the increase or decrease in the Contract Price from a Change Order, if any, shall be determined in one or more of the following ways as applicable to a specific situation and at the District's discretion:

17.8.1.1 District acceptance of a PCO;

17.8.1.2 By unit prices contained in Contractor's original bid;

17.8.1.3 By agreement between District and Contractor.

17.9 Deductive Change Orders

All deductive Change Order(s) must be prepared pursuant to the provisions herein. Where a portion of the Work is deleted from the Contract, the reasonable value of the deducted work less the value of work performed shall be considered the appropriate deduction. The value submitted on the Schedule of Values shall be used to calculate the credit amount unless the bid documentation is being held in escrow as part of the Contract Documents. Unit Prices, if any, may be used in District's discretion in calculating reasonable value. If Contractor offers a proposed amount for a deductive Change Order(s), Contractor shall include a minimum of five percent (5%) total profit and overhead to be deducted with the amount of the work of the Change Order(s). If Subcontractor work is involved, Subcontractors shall also include a minimum of five percent (5%) profit and overhead to be deducted with the amount of its deducted work. Any deviation from this provision shall not be allowed.

17.10 Addition or Deletion of Alternate Bid Item(s)

If the Bid Form and Proposal includes proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect to add or delete any such Alternate Bid Item(s) if not included in the Contract at the time of award. If the District elects to add or delete Alternate Bid Item(s) after Contract award, the cost or credit for such Alternate Bid Item(s) shall be as set forth in the Bid Form and Proposal unless the parties agree to a different price and the Contract Time shall be adjusted by the number of days allocated in the Contract Documents. If days are not allocated in the Contract Documents, the Contract Time shall be equitably adjusted.

17.11 Discounts, Rebates, and Refunds

For purposes of determining the cost, if any, of any change, addition, or omission to the Work hereunder, all trade discounts, rebates, refunds, and all returns from the sale of

surplus materials and equipment shall accrue and be credited to the Contractor, and the Contractor shall make provisions so that such discounts, rebates, refunds, and returns may be secured, and the amount thereof shall be allowed as a reduction of the Contractor's cost in determining the actual cost of construction for purposes of any change, addition, or omission in the Work as provided herein.

17.12 Construction Change Directives

17.12.1 A Construction Change Directive is a written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District and the Architect, directing a change in the Work. The District may, as provided by law, by Construction Change Directive and without invalidating the Contract, order changes in the Work consisting of additions, deletions, or other revisions. The adjustment to the Contract Price or Time, if any, is subject to the provisions of this section regarding Changes in the Work. If all or a portion of the Project is being funded by funds requiring approval by the State Allocation Board ("SAB"), these revisions may be subject to compensation once approval of same is received and funded by the SAB, and funds are released by the Office of Public School Construction ("OPSC"). Any dispute as to the adjustment in the Contract Price, if any, of the Construction Change Directive or timing of payment shall be resolved pursuant to the Payments and Claims Process provisions herein.

17.12.2 The District may issue a Construction Change Directive in the absence of agreement on the terms of a Change Order.

17.13 Force Account Directives

17.13.1 When work, for which a definite price has not been agreed upon in advance, is to be paid for on a force account basis, all direct costs necessarily incurred and paid by the Contractor for labor, material, and equipment used in the performance of that Work, shall be subject to the approval of the District and compensation will be determined as set forth herein.

17.13.2 The District will issue a Force Account Directive to proceed with the Work on a force account basis, and a not-to-exceed budget will be established by the District.

17.13.3 All requirements regarding direct cost for labor, labor burden, material, equipment, and markups on direct costs for overhead and profit described in this section shall apply to Force Account Directives. However, the District will only pay for actual costs verified in the field by the District or its authorized representative(s) on a daily basis.

17.13.4 The Contractor shall be responsible for all cost related to the administration of Force Account Directive. The markup for overhead and profit for Contractor modifications shall be full compensation to the Contractor to administer Force Account Directive, and Contractor shall not be entitled to separately recover additional amounts for overhead and/or profit.

17.13.5 The Contractor shall notify the District or its authorized representative(s) at least twenty-four (24) hours prior to proceeding with any of the force account work. Furthermore, the Contractor shall notify the District when it has consumed eighty percent (80%) of the budget, and shall not exceed the budget unless specifically authorized in writing by the District. The Contractor will not be compensated for force account work in the event that the Contractor fails to timely notify the District regarding the commencement of force account work, or exceeding the force account budget.

17.13.6 The Contractor shall diligently proceed with the work, and on a daily basis, submit a daily force account report using Document 00 63 47, "Daily Force Account Report," no later than 5:00 p.m. each day. The report shall contain a detailed itemization of the daily labor, material, and equipment used on the force account work only. The names of the individuals performing the force account work shall be included on the daily force account reports. The type and model of equipment shall be identified and listed. The District will review the information contained in the reports, and sign the reports no later than the next work day, and return a copy of the report to the Contractor for their records. The District will not sign, nor will the Contractor receive compensation for work the District cannot verify. The Contractor will provide a weekly force account summary indicating the status of each Force Account Directive in terms of percent complete of the not-to-exceed budget and the estimated percent complete of the work.

17.13.7 In the event the Contractor and the District reach a written agreement on a set cost for the work while the work is proceeding based on a Force Account Directive, the Contractor's signed daily force account reports shall be discontinued, and all previously signed reports shall be invalid.

17.14 Accounting Records

With respect to portions of the Work performed by Change Orders and Construction Change Directives, the Contractor shall keep and maintain cost-accounting records satisfactory to the District, including, without limitation, Job Cost Reports as provided in these General Conditions, which shall be available to the District on the same terms as any other books and records the Contractor is required to maintain under the Contract Documents. Such records shall include without limitation hourly records for Labor and Equipment and itemized records of materials and Equipment used that day in connection with the performance of any Work. All records maintained hereunder shall be subject to inspection, review and/or reproduction by the District, the Architect or the Project Inspector upon request. In the event that the Contractor fails or refuses, for any reason, to maintain or make available for inspection, review and/or reproduction such records, the District's reasonable good faith determination of the extent of adjustment to the Contract Price shall be final, conclusive, dispositive and binding upon Contractor.

17.15 Notice Required

If the Contractor desires to make a claim for an increase in the Contract Price, or any extension in the Contract Time for completion, it shall notify the District pursuant to the provisions herein including, without limitation, Article 25 Claims Process provisions. No claim shall be considered unless made in accordance with this subparagraph. Contractor

shall proceed to execute the Work even though the adjustment may not have been agreed upon. Any change in the Contract Price or extension of the Contract Time resulting from such claim shall be authorized by a Change Order.

17.16 Applicability to Subcontractors

Any requirements under this Article shall be equally applicable to Change Orders or Construction Change Directives issued to Subcontractors by the Contractor to the extent as required by the Contract Documents.

17.17 Alteration to Change Order Language

Contractor shall not alter Change Orders or reserve time in Change Orders. Change Orders altered in violation of this provision, if in conflict with the terms set forth herein, shall be construed in accordance with the terms set forth herein. Contractor shall execute finalized Change Orders and proceed under the provisions herein with proper notice.

17.18 Failure of Contractor to Execute Change Order

Contractor shall be in default of the Contract if Contractor fails to execute a Change Order when the Contractor agrees with the addition and/or deletion of the Work in that Change Order.

18. REQUEST FOR INFORMATION

18.1 Any Request for Information shall reference all applicable Contract Document(s), including Specification section(s), detail(s), page number(s), drawing number(s), and sheet number(s), etc. The Contractor shall make suggestions and interpretations of the issue raised by each Request for Information. A Request for Information cannot modify the Contract Price, Contract Time, or the Contract Documents. Upon request by the District, Contractor shall provide an electronic copy of the Request for Information in addition to the hard copy.

18.2 The Contractor shall be responsible for any costs incurred for professional services that District may deduct from any amounts owing to the Contractor, if a Request for Information requests an interpretation or decision of a matter where the information sought is equally available to the party making the request. District, at its sole discretion, shall deduct from and/or invoice Contractor for all the professional services arising herein.

19. PAYMENTS

19.1 Contract Price

The Contract Price is stated in the Agreement and, including authorized adjustments, is the total amount payable by the District to the Contractor for performance of the Work under the Contract Documents.

19.2 Applications for Progress Payments

19.2.1 Procedure for Applications for Progress Payments

19.2.1.1 Application for Progress Payment

19.2.1.1.1 Not before the fifth (5th) day of each calendar month during the progress of the Work, Contractor shall submit to the District and the Architect an itemized Application for Payment for operations completed in accordance with the Schedule of Values. Such application shall be notarized, if required, and supported by the following or each portion thereof unless waived by the District in writing:

19.2.1.1.1.1 The amount paid to the date of the Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;

19.2.1.1.1.2 The amount being requested under the Application for Payment by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;

19.2.1.1.1.3 The balance that will be due to each of such entities after said payment is made;

19.2.1.1.1.4 A certification that the As-Built Drawings and annotated Specifications are current;

19.2.1.1.1.5 Itemized breakdown of work done for the purpose of requesting partial payment;

19.2.1.1.1.6 An updated and acceptable construction schedule in conformance with the provisions herein;

19.2.1.1.1.7 The additions to and subtractions from the Contract Price and Contract Time;

19.2.1.1.1.8 A total of the retentions held;

19.2.1.1.1.9 Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the District may require from time to time;

19.2.1.1.1.10 The percentage of completion of the Contractor's Work by line item;

19.2.1.1.1.11 Schedule of Values updated from the preceding Application for Payment;

19.2.1.1.1.12 A duly completed and executed conditional waiver and release upon progress payment compliant with Civil Code section 8132 from the Contractor and each subcontractor of any tier and supplier to be paid from the current progress payment;

19.2.1.1.1.13 A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 8134 from the Contractor and each subcontractor of any tier and supplier that was paid from the previous progress payment(s); and

19.2.1.1.1.14 A certification by the Contractor of the following:

The Contractor warrants title to all Work performed as of the date of this payment application has been completed in accordance with the Contract Documents for the Project. The Contractor further warrants that all amounts have been paid for work which previous Certificates for Payment were issued and payments received and all Work performed as of the date of this payment application is free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, workers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work, except those of which the District has been informed. Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq.

19.2.1.1.1.15 The Contractor shall be subject to the False Claims Act set forth in Government Code section 12650 et seq. for information provided with any Application for Progress Payment.

19.2.1.1.1.16 All remaining certified payroll records ("CPR(s)") 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. As indicated herein, the District shall not make any payment to Contractor until:

19.2.1.1.1.16.1 Contractor and/or its Subcontractor(s) provide electronic CPRs directly to the DIR on no less than every 30 days while Work is being performed and within 30 days after the final day of Work performed on the Project for any journeyman, apprentice, worker or other employee was employed in connection with the Work, or within ten (10) days of any request by the District or the DIR to the requesting entity, and

19.2.1.1.1.16.2 Any delay in Contractor and/or its Subcontractor(s) providing CPRs in a timely manner may directly delay the Contractor's payment.

19.2.1.1.2 Applications received after June 20th will not be paid until the second week of July and applications received after December 12th will not be paid until the first week of January.

19.2.2 Prerequisites for Progress Payments

19.2.2.1 First Payment Request: The following items, if applicable, must be completed before the District will accept and/or process the Contractor's first payment request:

19.2.2.1.1 Installation of the Project sign;

19.2.2.1.2 Installation of field office;

19.2.2.1.3 Installation of temporary facilities and fencing;

19.2.2.1.4 Schedule of Values;

19.2.2.1.5 Contractor's Construction Schedule;

19.2.2.1.6 Schedule of unit prices, if applicable;

19.2.2.1.7 Submittal Schedule;

19.2.2.1.8 Receipt by Architect of all submittals due as of the date of the payment application;

19.2.2.1.9 Copies of necessary permits;

19.2.2.1.10 Copies of authorizations and licenses from governing authorities;

19.2.2.1.11 Initial progress report;

19.2.2.1.12 Surveyor qualifications;

19.2.2.1.13 Written acceptance of District's survey of rough grading, if applicable;

19.2.2.1.14 List of all Subcontractors, with names, license numbers, telephone numbers, and Scope of Work;

19.2.2.1.15 All bonds and insurance endorsements; and

19.2.2.1.16 Resumes of Contractor's project manager, and if applicable, job site secretary, record documents recorder, and job site superintendent.

19.2.2.2 Second Payment Request: The District will not process the second payment request until and unless all submittals and Shop Drawings have been accepted for review by the Architect.

19.2.2.3 No Waiver of Criteria: Any payments made to Contractor where criteria set forth herein have not been met shall not constitute a waiver of said criteria by District. Instead, such payment shall be construed as a good faith effort by District to resolve differences so Contractor may pay its Subcontractors and suppliers. Contractor agrees that failure to submit such items may constitute a breach of contract by Contractor and may subject Contractor to termination.

19.3 Progress Payments

19.3.1 District's Approval of Application for Payment

19.3.1.1 Upon receipt of an Application for Payment, The District shall act in accordance with both of the following:

19.3.1.1.1 Each Application for Payment shall be reviewed by the District as soon as practicable after receipt for the purpose of determining that the Application for Payment is a proper Application for Payment.

19.3.1.1.2 Any Application for Payment determined not to be a proper Application for Payment suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) days, after receipt. An Application for Payment returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the Application for Payment is not proper. The number of days available to the District to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the District exceeds this seven-day return requirement.

19.3.1.1.3 An Application for Payment shall be considered properly executed if funds are available for payment of the Application for Payment, and payment is not delayed due to an audit inquiry by the financial officer of the District.

19.3.1.2 The District's review of the Contractor's Application for Payment will be based on the District's and the Architect's observations at the Site and the data comprising the Application for Payment that the Work has progressed to the point indicated and that, to the best of the District's and the Architect's knowledge, information, and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to:

19.3.1.2.1 Observation of the Work for general conformance with the Contract Documents,

19.3.1.2.2 Results of subsequent tests and inspections,

19.3.1.2.3 Minor deviations from the Contract Documents correctable prior to completion, and

19.3.1.2.4 Specific qualifications expressed by the Architect.

19.3.1.3 District's approval of the certified Application for Payment shall be based on Contractor complying with all requirements for a fully complete and valid certified Application for Payment.

19.3.2 Payments to Contractor

19.3.2.1 Within thirty (30) days after approval of the Application for Payment, Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of the Work performed (as verified by Architect and Inspector and certified by Contractor) up to the last day of the previous month, less the aggregate of previous payments and amount to be withheld. The value of the Work completed shall be Contractor's best estimate. No inaccuracy or error in said estimate shall operate to release the Contractor, or any Surety upon any bond, from damages arising from such Work, or from the District's right to enforce each and every provision of this Contract, and the District shall have the right subsequently to correct any error made in any estimate for payment.

19.3.2.2 The Contractor shall not be entitled to have any payment requests processed or be entitled to have any payment made for Work performed, so long as any lawful or proper direction given by the District concerning the Work, or any portion thereof, remains incomplete.

19.3.2.3 If the District fails to make any progress payment within thirty (30) days after receipt of an undisputed and properly submitted Application for Payment from the Contractor, the District shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

19.3.3 No Waiver

No payment by District hereunder shall be interpreted so as to imply that District has inspected, approved, or accepted any part of the Work. Notwithstanding any payment, the District may enforce each and every provision of this Contract. The District may correct or require correction of any error subsequent to any payment.

19.4 Decisions to Withhold Payment

19.4.1 Reasons to Withhold Payment

The District may withhold payment in whole, or in part, to the extent reasonably necessary to protect the District if, in the District's opinion, the representations to the District required herein cannot be made. The District may withhold payment, in whole, or in part, to such extent as may be necessary to protect the District from loss because of, but not limited to any of the following:

19.4.1.1 Defective Work not remedied within **FORTY-EIGHT (48)** hours of written notice to Contractor.

19.4.1.2 Stop Payment Notices or other liens served upon the District as a result of the Contract. Contractor agrees that the District may withhold up to

125% of the amount claimed in the Stop Payment Notice to answer the claim and to provide for the District's reasonable cost of any litigation pursuant to the stop payment notice.

19.4.1.3 Written notice to withhold payment from Contractor by payment and/or performance bond surety(ies).

19.4.1.4 Liquidated damages assessed against the Contractor.

19.4.1.5 The cost of completion of the Contract if there exists a reasonable doubt that the Work can be completed for the unpaid balance of the Contract Price or by the completion date.

19.4.1.6 Damage to the District or other contractor(s).

19.4.1.7 Unsatisfactory prosecution of the Work by the Contractor.

19.4.1.8 Failure to store and properly secure materials.

19.4.1.9 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.

19.4.1.10 Failure of the Contractor to maintain As-Built Drawings.

19.4.1.11 Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment.

19.4.1.12 Unauthorized deviations from the Contract Documents.

19.4.1.13 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.

19.4.1.14 Failure to provide acceptable electronic certified payroll records, as required by the Labor Code, by these Contract Documents, or by written request; for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or by each Subcontractor in connection with the Work for the period of the Application for Payment or if payroll records are delinquent or inadequate.

19.4.1.15 Failure to properly pay prevailing wages as required in Labor Code section 1720 et seq., failure to comply with any other Labor Code requirements, and/or failure to comply with labor compliance monitoring and enforcement by the DIR.

19.4.1.16 Allowing an unregistered subcontractor, as described in Labor Code section 1725.5, to engage in the performance of any work under this Contract.

19.4.1.17 Failure to comply with any applicable federal statutes and regulations regarding minimum wages, withholding, payrolls and basic records, apprentice and trainee employment requirements, equal employment opportunity requirements, Copeland Act requirements, Davis-Bacon Act and related requirements, Contract Work Hours and Safety Standards Act requirements, if applicable.

19.4.1.18 Failure to properly maintain or clean up the Site.

19.4.1.19 Failure to timely indemnify, defend, or hold harmless the District.

19.4.1.20 Any payments due to the District, including but not limited to payments for failed tests, utilities changes, or permits.

19.4.1.21 Failure to pay Subcontractor(s) or supplier(s) as required by law and by the Contract Documents.

19.4.1.22 Failure to pay any royalty, license or similar fees.

19.4.1.23 Contractor is otherwise in breach, default, or in substantial violation of any provision of this Contract.

19.4.1.24 Failure to perform any implementation and/or monitoring required by any SWPPP for the Project and/or the imposition of any penalties or fines therefore whether imposed on the District or Contractor.

19.4.2 Reallocation of Withheld Amounts

19.4.2.1 District may, in its discretion, apply any withheld amount to pay outstanding claims or obligations as defined herein. In so doing, District shall make such payments on behalf of Contractor. If any payment is so made by District, then that amount shall be considered a payment made under Contract by District to Contractor and District shall not be liable to Contractor for any payment made in good faith. These payments may be made without prior judicial determination of claim or obligation. District will render Contractor an accounting of funds disbursed on behalf of Contractor.

19.4.2.2 If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision thereof, District may, after **FORTY-EIGHT (48)** hours' written notice to the Contractor and, without prejudice to any other remedy, make good such deficiencies. The District shall adjust the total Contract Price by reducing the amount thereof by the cost of making good such deficiencies. If District deems it inexpedient to correct Work that is damaged, defective, or not done in accordance with Contract provisions, an equitable reduction in the Contract Price (of at least one hundred fifty percent (150%) of the estimated reasonable value of the nonconforming Work) shall be made therefor.

19.4.3 Payment After Cure

When Contractor removes the grounds for declining approval, payment shall be made for amounts withheld because of them. No interest shall be paid on any retainage or amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

19.5 Subcontractor Payments

19.5.1 Payments to Subcontractors

No later than seven (7) days after receipt, or pursuant to Business and Professions Code section 7108.5 and Public Contract Code section 7107, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to its Sub-subcontractors in a similar manner.

19.5.2 No Obligation of District for Subcontractor Payment

The District shall have no obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.

19.5.3 Joint Checks

District shall have the right in its sole discretion, if necessary for the protection of the District, to issue joint checks made payable to the Contractor and Subcontractors and/or material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint check payment be construed to create any contract between the District and a Subcontractor of any tier, or a material or equipment supplier, any obligation from the District to such Subcontractor or a material or equipment supplier, or rights in such Subcontractor or a material or equipment supplier against the District.

20. COMPLETION OF THE WORK

20.1 Completion

20.1.1 District will accept completion of Contract and have the Notice of Completion recorded when the entire Work shall have been completed to the satisfaction of District.

20.1.2 The Work may only be accepted as complete by action of the governing board of the District.

20.1.3 District, at its sole option, may accept completion of Contract and have the Notice of Completion recorded when the entire Work shall have been completed to the satisfaction of District, except for minor corrective items, as distinguished

from incomplete items. If Contractor fails to complete all minor corrective items within fifteen (15) days after the date of the District's acceptance of completion, District shall withhold from the final payment one hundred fifty percent (150%) of an estimate of the amount sufficient to complete the corrective items, as determined by District, until the item(s) are completed.

20.1.4 At the end of the 15-day period, if there are any items remaining to be corrected, District may elect to proceed as provided herein related to adjustments to Contract Price, and/or District's right to perform the Work of the Contractor.

20.2 Close-Out/Certification Procedures

20.2.1 Punch List

The Contractor shall notify the Architect when Contractor considers the Work complete. Upon notification, Architect will prepare a list of minor items to be completed or corrected ("Punch List"). The Contractor and/or its Subcontractors shall proceed promptly to complete and correct items on the Punch List. Failure to include an item on Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

20.2.2 Close-Out/Certification Requirements

20.2.2.1 Utility Connections

Buildings shall be connected to water, gas, sewer, and electric services, complete and ready for use. Service connections shall be made and existing services reconnected.

20.2.2.2 Record Drawings and Record Specifications

20.2.2.2.1 Contractor shall provide exact Record Drawings of the Work ("As-Builts") and Record Specifications upon completion of the Project and as a condition precedent to approval of final payment.

20.2.2.2.2 Contractor shall obtain the Inspector's approval of the corrected prints and employ a competent draftsman to transfer the Record Drawings information to the most current version of AutoCAD that is, at that time, currently utilized for plan check submission by either the District, the Architect, OPSC, and/or DSA, and print a complete set of transparent sepias. When completed, Contractor shall deliver to the District corrected sepias and data storage device acceptable to District with AutoCAD file.

20.2.2.2.3 Contractor is liable and responsible for any and all inaccuracies in the Record Drawings and Record Specifications, even if inaccuracies become evident at a future date.

20.2.2.3 Construction Storm Water Permit, if applicable

Contractor shall submit to District all electronic or hard copy records required by the Construction Storm Water Permit, if applicable, within seven (7) days of Completion of the Project.

20.2.2.4 Spare Parts and Maintenance Manuals:

20.2.2.4.1 Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

20.2.2.4.2 Contractor shall prepare all operation and maintenance manuals and date as indicated in the Specifications.

20.2.2.5 Instruction of District Personnel:

20.2.2.5.1 Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.

20.2.2.5.2 For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.

20.2.2.5.3 Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

20.2.2.5.4 Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.

20.2.2.5.5 Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

20.2.2.6 Source Programming: Contractor shall provide all source programming for all items in the Project.

20.2.2.7 Verified Reports: Contractor shall completely and accurately fill out and file forms DSA 6-C or DSA 152 (or current form), as appropriate. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

20.3 Final Inspection

20.3.1 Contractor shall comply with Punch List procedures as provided herein and maintain the presence of a Project Superintendent and Project Manager until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall Contractor demobilize its forces prior to completion of the Punch List without District's prior written approval. Upon receipt of Contractor's written notice that all of the Punch List items have been fully completed and the Work is ready for final inspection and District acceptance, Architect and Project

Inspector will inspect the Work and shall submit to Contractor and District a final inspection report noting the Work, if any, required in order to complete in accordance with the Contract Documents. Absent unusual circumstances, this report shall consist of the Punch List items not yet satisfactorily completed.

20.3.2 Upon Contractor's completion of all items on the Punch List and any other uncompleted portions of the Work, the Contractor shall notify the District and Architect, who shall again inspect such Work. If the Architect finds the Work complete and acceptable under the Contract Documents, the Architect will notify Contractor, who shall then jointly submit to the Architect and the District its final Application for Payment.

20.3.3 Final Inspection Requirements

20.3.3.1 Before calling for final inspection, Contractor shall determine that the following have been performed:

20.3.3.1.1 The Work has been completed.

20.3.3.1.2 All life safety items are completed and in working order.

20.3.3.1.3 Mechanical and electrical Work including, without limitation, security system, data, and fire alarm, are complete and tested, fixtures are in place, connected, and ready for tryout.

20.3.3.1.4 Electrical circuits scheduled in panels and disconnect switches labeled.

20.3.3.1.5 Replace filters of operating equipment.

20.3.3.1.6 Painting and special finishes complete.

20.3.3.1.7 Doors complete with hardware, cleaned of protective film, relieved of sticking or binding, and in working order.

20.3.3.1.8 Tops and bottoms of doors sealed.

20.3.3.1.9 Floors waxed and polished as specified.

20.3.3.1.10 Carpeted and soft surfaces vacuumed.

20.3.3.1.11 Broken glass replaced and interior and exterior glass and all surfaces exposed to view cleaned.

20.3.3.1.12 Equipment and fixtures cleaned to a sanitary condition.

20.3.3.1.13 Grounds cleared of Contractor's equipment, raked clean of debris, and remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

20.3.3.1.14 Site cleaned, paved areas swept, and clean landscaped surfaces raked.

20.3.3.1.15 Roofs, gutters, down spouts, and drainage systems cleaned of debris.

20.3.3.1.16 Work cleaned, free of stains, scratches, and other foreign matter, and damaged and broken material replaced.

20.3.3.1.17 Temporary labels, tape, stains, and foreign substances removed, transparent and glossy surfaces polished,

20.3.3.1.18 Finished and decorative work shall have marks, dirt, and superfluous labels removed.

20.3.3.1.19 Final cleanup, as provided herein.

20.4 Costs of Multiple Inspections

More than two (2) requests of the District to make a final inspection shall be considered an additional service of District, Architect, Construction Manager, and/or Project Inspector, and all subsequent costs will be invoiced to Contractor and if funds are available, withheld from remaining payments.

20.5 Partial Occupancy or Use Prior to Completion

20.5.1 District's Rights to Occupancy

The District may occupy or use any completed or partially completed portion of the Work at any stage, and such occupancy shall not constitute the District's Final Acceptance of any part of the Work. 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. In the event that the District occupies or uses any completed or partially completed portion of the Work, the Contractor shall remain responsible for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents unless the Contractor requests in writing, and the District agrees, to otherwise divide those responsibilities. Any dispute as to responsibilities shall be resolved pursuant to the Claims Process provisions herein, with the added provision that during the dispute process, the District shall have the right to occupy or use any portion of the Work that it needs or desires to use.

20.5.2 Inspection Prior to Occupancy or Use

Immediately prior to partial occupancy or use, the District, the Contractor, and the Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

20.5.3 No Waiver

Unless otherwise agreed upon, partial or entire occupancy or use of a portion or portions of the Work shall not constitute beneficial occupancy or District's acceptance of the Work not complying with the requirements of the Contract Documents.

21. FINAL PAYMENT AND RETENTION

21.1 Final Payment

Upon receipt and approval of a valid and final Application for Payment, the Architect will issue a final Certificate of Payment. The District shall thereupon jointly inspect the Work and either accept the Work as complete or notify the Architect and the Contractor in writing of reasons why the Work is not complete. Upon District's acceptance of the Work of the Contractor as fully complete by the Governing Board of the District (that, absent unusual circumstances, will occur when the Punch List items have been satisfactorily completed), the District shall record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of final payment from the District, pay the amount due Subcontractors.

21.2 Prerequisites for Final Payment

The following conditions must be fulfilled prior to Final Payment:

21.2.1 A full release of all Stop Payment Notices served in connection with the Work shall be submitted by Contractor.

21.2.2 A duly completed and executed conditional waiver and release upon final payment compliant with Civil Code section 8136, from the Contractor and each subcontractor of any tier and supplier to be paid from the final payment.

21.2.3 A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 8134, from the Contractor and each subcontractor of any tier and supplier that was paid from the previous progress payments.

21.2.4 A duly completed and executed Document 00 65 19.26, "AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS" from the Contractor.

21.2.5 The Contractor shall have made all corrections to the Work that are required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and ordinances, or to fulfill any of the orders or directions of District required under the Contract Documents.

21.2.6 Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, and bonds required by the Contract Documents for its portion of the Work.

21.2.7 Contractor must have completed all requirements set forth under "Close-Out/Certification Procedures," including, without limitation, submission of an approved set of complete Record Drawings.

21.2.8 Architect shall have issued its written approval that final payment can be made.

21.2.9 The Contractor shall have delivered to the District all manuals and materials required by the Contract Documents, which must be approved by the District.

21.2.10 The Contractor shall have completed final clean-up as provided herein.

21.3 Retention

21.3.1 The retention, less any amounts disputed by the District or that the District has the right to withhold pursuant to provisions herein, shall be paid:

21.3.1.1 After approval by the Architect of the Application and Certificate of Payment,

21.3.1.2 After the satisfaction of the conditions set forth herein, and

21.3.1.3 After forty-five (45) days after the recording of the Notice of Completion by District.

21.3.2 No interest shall be paid on any retention, or on any amounts withheld due to a failure of the Contractor to perform, in accordance with the terms and conditions of the Contract Documents, except as provided to the contrary in any Escrow Agreement between the District and the Contractor pursuant to Public Contract Code section 22300.

21.4 Substitution of Securities

The District will permit the substitution of securities in accordance with the provisions of Public Contract Code section 22300.

22. UNCOVERING OF WORK

If a portion of the Work is covered without Inspector or Architect approval or not in compliance with the Contract Documents, it must, if required in writing by the District, the Project Inspector, or the Architect, be uncovered for the Project Inspector's or the Architect's observation and be corrected, replaced, and/or recovered at the Contractor's expense without change in the Contract Price or Contract Time.

23. NONCONFORMING WORK AND CORRECTION OF WORK

23.1 Nonconforming Work

23.1.1 Contractor shall promptly remove from Premises all Work identified by District as failing to conform to the Contract Documents whether incorporated or not. Contractor shall promptly replace and re-execute its own Work to comply with the Contract Documents without additional expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by any removal or replacement pursuant hereto and/or any delays to the District or other Contractors caused thereby.

23.1.2 If Contractor does not remove Work that District has identified as failing to conform to the Contract Documents within a reasonable time, not to exceed **FORTY-EIGHT (48)** hours, District may remove it and may store any material at Contractor's expense. If Contractor does not pay expense(s) of that removal within ten (10) days' time thereafter, District may, upon ten (10) days' written notice, sell any material at auction or at private sale and shall deduct all costs and expenses incurred by the District and/or District may withhold those amounts from payment(s) to Contractor.

23.2 Correction of Work

23.2.1 Correction of Rejected Work

Pursuant to the notice provisions herein, the Contractor shall immediately correct the Work rejected by the District, the Architect, or the Project Inspector as failing to conform to the requirements of the Contract Documents, whether observed before or after Completion and whether or not fabricated, installed, or completed. The Contractor shall bear costs of correcting the rejected Work, including additional testing, inspections, and compensation for the Inspector's or the Architect's services and expenses made necessary thereby.

23.2.2 One-Year Warranty Corrections

If, within one (1) year after the date of Completion of the Work or a designated portion thereof, or after the date for commencement of warranties established hereunder, or by the terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the District to do so. This period of one (1) year shall be extended with respect to portions of the Work first performed after Completion by the period of time between Completion and the actual performance of the Work. This obligation hereunder shall survive District's acceptance of the Work

under the Contract and termination of the Contract. The District shall give such notice promptly after discovery of the condition.

23.3 District's Right to Perform Work

23.3.1 If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this contract, the District, after **FORTY-EIGHT (48)** hours' written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

23.3.2 If it is found at any time, before or after completion of the Work, that Contractor has varied from the Drawings and/or Specifications, including, but not limited to, variation in material, quality, form, or finish, or in the amount or value of the materials and labor used, District may require at its option:

23.3.2.1 That all such improper Work be removed, remade or replaced, and all work disturbed by these changes be made good by Contractor at no additional cost to the District;

23.3.2.2 That the District deduct from any amount due Contractor the sum of money equivalent to the difference in value between the work performed and that called for by the Drawings and Specifications; or

23.3.2.3 That the District exercise any other remedy it may have at law or under the Contract Documents, including but not limited to the District hiring its own forces or another contractor to replace the Contractor's nonconforming Work, in which case the District shall either issue a deductive Change Order, a Construction Change Directive, or invoice the Contractor for the cost of that work. Contractor shall pay any invoices within thirty (30) days of receipt of same or District may withhold those amounts from payment(s) to Contractor.

24. TERMINATION AND SUSPENSION

24.1 District's Request for Assurances

If District at any time reasonably believes Contractor is or may be in default under this Contract, District may in its sole discretion notify Contractor of this fact and request written assurances from Contractor of performance of Work and a written plan from Contractor to remedy any potential default under the terms this Contract that the District may advise Contractor of in writing. Contractor shall, within ten (10) calendar days of District's request, deliver a written cure plan that meets the District's requirements in its request for assurances. Contractor's failure to provide such written assurances of performance and the required written plan, within ten (10) calendar days of request, will constitute a material breach of this Contract sufficient to justify termination for cause.

24.2 District's Right to Terminate Contractor for Cause

24.2.1 Grounds for Termination: The District, in its sole discretion, may terminate the Contract and/or terminate the Contractor's right to perform the work of the Contract based upon any of the following:

24.2.1.1 Contractor refuses or fails to execute the Work or any separable part thereof with sufficient diligence as will ensure its completion within the time specified or any extension thereof, or

24.2.1.2 Contractor fails to complete said Work within the time specified or any extension thereof, or

24.2.1.3 Contractor persistently fails or refuses to perform Work or provide material of sufficient quality as to be in compliance with Contract Documents; or

24.2.1.4 Contractor persistently refuses, or repeatedly fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials to complete the Work in the time specified; or

24.2.1.5 Contractor fails to make prompt payment to Subcontractors, or for material, or for labor; or

24.2.1.6 Contractor persistently disregards laws, or ordinances, or instructions of District; or

24.2.1.7 Contractor fails to supply labor, including that of Subcontractors, that is sufficient to prosecute the Work or that can work in harmony with all other elements of labor employed or to be employed on the Work; or

24.2.1.8 Contractor or its Subcontractor(s) is/are otherwise in breach, default, or in substantial violation of any provision of this Contract, including but not limited to a lapse in licensing or registration.

24.2.2 Notification of Termination

24.2.2.1 Upon the occurrence at District's sole determination of any of the above conditions, District may, without prejudice to any other right or remedy, serve written notice upon Contractor and its Surety of District's termination of this Contract and/or the Contractor's right to perform the work of the Contract. This notice will contain the reasons for termination. Unless, within three (3) days after the service of the notice, any and all condition(s) shall cease, and any and all violation(s) shall cease, or arrangement satisfactory to District for the correction of the condition(s) and/or violation(s) be made, this Contract and/or the Contractor's right to perform the Work of the Contract shall cease and terminate. Upon termination, Contractor shall not be entitled to receive any further payment until the entire Work is finished.

24.2.2.2 Upon termination, District may immediately serve written notice of tender upon Surety whereby Surety shall have the right to take over and perform this Contract only if Surety:

24.2.2.2.1 Within three (3) days after service upon it of the notice of tender, gives District written notice of Surety's intention to take over and perform this Contract; and

24.2.2.2.2 Commences performance of this Contract within three (3) days from date of serving of its notice to District.

24.2.2.3 Surety shall not utilize Contractor in completing the Project if the District notifies Surety of the District's objection to Contractor's further participation in the completion of the Project. Surety expressly agrees that any contractor which Surety proposes to fulfill Surety's obligations is subject to District's approval. District's approval shall not be unreasonably withheld, conditioned or delayed.

24.2.2.4 If Surety fails to notify District or begin performance as indicated herein, District may take over the Work and execute the Work to completion by any method it may deem advisable at the expense of Contractor and/or its Surety. Contractor and/or its Surety shall be liable to District for any excess cost or other damages the District incurs thereby. Time is of the essence in this Contract. If the District takes over the Work as herein provided, District may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plan, and other property belonging to Contractor as may be on the Site of the Work, in bonded storage, or previously paid for.

24.2.2.5 In the alternative, the District shall have the right (but shall have no obligation) to assume and/or assign to a general contractor or construction manager or other third party who is qualified and has sufficient resources to complete the Work, the rights of the Contractor under its subcontracts with any or all Subcontractors. In the event of an assumption or assignment by the District, no Subcontractor shall have any claim against the District or third party for Work performed by Subcontractor or other matters arising prior to

termination of the Contract and/or the Contractor's right to perform the work of the Contract. The District or any third party, as the case may be, shall be liable only for obligations to the Subcontractor arising after assumption or assignment. Should the District so elect, the Contractor shall execute and deliver all documents and take all steps, including the legal assignment of its contractual rights, as the District may require, for the purpose of fully vesting in the District the rights and benefits of its Subcontractor under Subcontracts or other obligations or commitments. All payments due the Contractor hereunder shall be subject to a right of offset by the District for expenses and damages suffered by the District as a result of any default, acts, or omissions of the Contractor. Contractor must include this assignment provision in all of its contracts with its Subcontractors.

24.2.3 In the event of a termination for cause, if the expense to the District to finish the Work exceeds the unpaid Contract Price, Contractor and Surety shall pay difference to District within twenty-one (21) days of District's request.

24.2.4 In the event a termination for cause is later determined to have been made wrongfully or without cause, then the termination shall be treated as a termination for convenience, effective as of the same date as the purported termination for cause, and the Contractor shall have no greater rights than it would have had following a termination for convenience. Any Contractor claim arising out of a termination for cause shall be made in accord with Article 12 herein. No other loss, cost, damage, expense or liability may be claimed, requested or recovered by the Contractor.

24.3 Termination of Contractor for Convenience

24.3.1 District in its sole discretion may terminate the Contract in whole or in part upon three (3) days' written notice to the Contractor.

24.3.2 Upon notice, Contractor shall:

24.3.2.1 Cease operations as directed by the District in the notice;

24.3.2.2 Take necessary actions for the protection and preservation of the Work as soon as possible; and

24.3.2.3 Terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

24.3.3 Within 30 days of the notice, Contractor submit to the District a payment application for the actual cost for labor, materials, and services performed, including all Contractor's and Subcontractor(s)' mobilization and/or demobilization costs, that is unpaid. Contractor shall have no claims against the District except for the actual cost for labor, materials, and services performed that adequately documented through timesheets, invoices, receipts, or otherwise. District shall pay all undisputed invoice(s) for work performed until the notice of termination.

24.3.4 If Contractor objects to the termination for convenience, including disagreement on the actual cost due Contractor, the District retains the right to all the options available to the District under a termination for cause.

24.4 Effect of Termination

24.4.1 Contractor shall, only if ordered to do so by the District, immediately remove from the Site all or any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The District retains the right, but not the obligation, to keep and use any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The Contractor and its Surety shall be liable upon the Performance Bond for all damages caused to the District by reason of the Contractor's failure to complete the Contract.

24.4.2 In the event that the District shall perform any portion of, or the whole of the Work, pursuant to the provisions of the General Conditions, the District shall not be liable nor account to the Contractor in any way for the time within which, or the manner in which, the Work is performed by the District or for any changes the District may make in the Work or for the money expended by the District in satisfying claims and/or suits and/or other obligations in connection with the Work.

24.4.3 In the event that the Contract is terminated for any reason, no allowances or compensation will be granted for the loss of any anticipated profit by the Contractor or any impact or impairment of Contractor's bonding capacity.

24.4.4 The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to District.

24.5 Emergency Termination of Public Contracts Act of 1949

24.5.1 This Contract is subject to termination as provided by sections 4410 and 4411 of the Government Code of the State of California, being a portion of the Emergency Termination of Public Contracts Act of 1949.

24.5.1.1 Section 4410 of the Government Code states:

In the event a national emergency occurs, and public work, being performed by contract, is stopped, directly or indirectly, because of the freezing or diversion of materials, equipment or labor, as the result of an order or a proclamation of the President of the United States, or of an order of any federal authority, and the circumstances or conditions are such that it is impracticable within a reasonable time to proceed with a substantial portion of the work, then the public agency and the contractor may, by written agreement, terminate said contract.

24.5.1.2 Section 4411 of the Government Code states:

Such an agreement shall include the terms and conditions of the termination of the contract and provision for the payment of compensation or money, if any,

which either party shall pay to the other or any other person, under the facts and circumstances in the case.

24.5.2 Compensation to the Contractor shall be determined at the sole discretion of District on the basis of the reasonable value of the Work done, including preparatory work. As an exception to the foregoing and at the District's discretion, in the case of any fully completed separate item or portion of the Work for which there is a separate previously submitted unit price or item on the accepted schedule of values, that price shall control. The District, at its sole discretion, may adopt the Contract Price as the reasonable value of the work done or any portion thereof.

24.6 Suspension of Work

24.6.1 District in its sole discretion may suspend, delay or interrupt the Work in whole or in part for such period of time as the District may determine upon three (3) days written notice to the Contractor.

24.6.1.1 An adjustment may be made for changes in the cost of performance of the Work caused by any such suspension, delay or interruption. No adjustment shall be made to the extent:

24.6.1.1.1 That performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible; or

24.6.1.1.2 That an equitable adjustment is made or denied under another provision of the Contract; or

24.6.1.1.3 That the suspension of Work was the direct or indirect result of Contractor's failure to perform any of its obligations hereunder.

24.6.1.2 Any adjustments in cost of performance may have a fixed or percentage fee as provided in the section on Format for Proposed Change Order herein. This amount shall be full compensation for all Contractor's and its Subcontractor(s)' changes in the cost of performance of the Contract caused by any such suspension, delay or interruption.

25. CLAIMS PROCESS

25.1 Obligation to File Claims for Disputes

25.1.1 Should Contractor otherwise seek extra time or compensation for any reason whatsoever, then Contractor shall first follow procedures set forth in the Contract Documents including, without limitation, Articles 15, 16 and 17, all of which are conditions precedent to submitting a Claim pursuant to Article 25. A Notice of Delay or Proposed Change Order are less formal procedures that proceed the formal claim and do not constitute a Claim. A Claim also does not include correspondence, RFIs, vouchers, invoices, progress payment applications, or other routine or authorized form of requests for progress payments in compliance with the Contract.

If a dispute remains, then Contractor shall give written notice to District that expressly invokes this Article 25 within the time limits set forth herein.

25.1.2 Contractor's sole and exclusive remedy for a Dispute is to file a written claim setting forth Contractor's position as required herein within the time limits set forth herein.

25.2 Duty to Perform during Claim Process

Contractor and its subcontractors shall continue to perform its Work under the Contract including the disputed work and shall not cause a delay of the Work during any dispute, claim, negotiation, mediation, or arbitration proceeding, except by written agreement by the District.

25.3 Definition of Claim

25.3.1 Pursuant to Public Contract Code section 9204, the term "Claim" means a separate demand by the Contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

25.3.1.1 A time extension, including without limitation, for relief of damages or penalties for delay assessed by the District under the Contract;

25.3.1.2 Payment by the District of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or to which Contractor is not otherwise entitled to; or

25.3.1.3 An amount of payment disputed by the District.

25.4 Claims Presentation

25.4.1 Form and Contents of Claim

25.4.1.1 If Contractor intends to submit a Claim for an increase in the Contract Price and/or Contract Time for any reason including, without limitation, the acts of District or its agents, Contractor shall, within thirty (30) days after the event giving rise to the Claim, give notice of the Claim ("Notice of Potential Claim") in writing specifically identifying Contractor is invoking this Article 25 Claims Presentation. The Notice of Potential Claim shall provide Contractor's preliminary request for an adjustment to the Contract Price and/or Contract Time, with a description of the grounds therefore.

25.4.1.2 Within thirty (30) days after serving the written Notice of Potential Claim, Contractor shall provide a Claim including an itemized statement of the details and amounts of its Claim for any increase in the Contract Price of Contract Time as provided below, including a Time Impact Analysis and any and all other documentation substantiating Contractor's claimed damages:

25.4.1.2.1 The issues, events, conditions, circumstances and/or causes giving rise to the dispute, and shall show, in detail, the cause and effect of same;

25.4.1.2.2 Citation to provisions in the Contract Documents, statute sections, and/or case law entitling Contractor to an increase in the Contract Price or Contract Time;

25.4.1.2.3 The pertinent dates and/or durations and actual and/or anticipated effects on the Contract Price, Contract Schedule milestones and/or Contract Time adjustments;

25.4.1.2.4 The Time Impact Analysis of all time delays that shows actual time impact on the critical path; and

25.4.1.2.5 The line-item costs for labor, material, and/or equipment, if applicable, for all cost impacts priced like a change order according to Article 17 and must be updated monthly as to cost and entitlement if a continuing claim.

25.4.1.3 The Claim shall include the following certification by the Contractor:

25.4.1.3.1 The undersigned Contractor certifies under penalty of perjury that the attached dispute is made in good faith; that the supporting data is accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the adjustment for which Contractor believes the District is liable; and that I am duly authorized to certify the dispute on behalf of the Contractor.

25.4.1.3.2 Furthermore, Contractor understands that the value of the attached dispute expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from the Work performed on the Project, additional time required on the Project and/or resulting from delay to the Project including, without limitation, cumulative impacts. Contractor may not separately recover for overhead or other indirect costs. Any costs, expenses, damages, or time extensions not included are deemed waived.

25.4.2 Contractor shall bear all costs incurred in the preparation and submission of a Claim.

25.4.3 Failure to timely submit a Claim and the requisite supporting documentation shall constitute a waiver of Contractor's claim(s) against the District and Contractor's Claim(s) for compensation or an extension of time shall be deemed waived, released, and discharged as to any entitlement for adjustment to Contract Price and/or Contract Time.

25.5 Claim Resolution pursuant to Public Contract Code section 9204

Contractor may request to waive the claims procedure under Public Contract Code section 9204 and proceed directly to the commencement of a civil action or binding

arbitration. If Contractor chooses to proceed, Contractor shall comply with the following steps:

25.5.1 STEP 1:

25.5.1.1 Upon receipt of a Claim by registered or certified mail, return receipt requested, including the documents necessary to substantiate it, the District shall conduct a reasonable review of the Claim and, within a period not to exceed forty-five (45) days, shall provide the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed. Upon receipt of a Claim, the District and Contractor may, by mutual agreement, extend the time period to provide a written statement. If the District needs approval from its governing body to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the Claim, and the governing body does not meet within the forty-five (45) days or within the mutually agreed to extension of time following receipt of Claim sent by registered mail or certified mail, return receipt requested, the District shall have up to three (3) days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide Contractor a written statement identifying the disputed portion and the undisputed portion.

25.5.1.1.1 Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the District issues its written statement. Amounts not paid in a timely manner as required by this section shall bear interest at seven percent (7%) per annum.

25.5.1.2 Upon receipt of a Claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable. In this instance, District and Contractor must comply with the sections below regarding Public Contract Code section 20104, et seq. and Government Code Claim Act Claims.

25.5.1.3 If the District fails to issue a written statement, or to otherwise meet the time requirements of this section, this shall result in the Claim being deemed rejected in its entirety. A Claim that is denied by reason of the District's failure to have responded to a Claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the Claim or the responsibility or qualifications of Contractor.

25.5.2 STEP 2:

25.5.2.1 If Contractor disputes the District's written response, or if the District fails to respond to a Claim within the time prescribed, Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the District shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute. Within ten (10) business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the District shall provide the

Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed.

25.5.2.1.1.1 Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the District issues its written statement. Amounts not paid in a timely manner as required by this section shall bear interest at seven percent (7%) per annum.

25.5.3 STEP 3:

25.5.3.1 Any disputed portion of the Claim, as identified by Contractor in writing, shall be submitted to nonbinding mediation, with the District and Contractor sharing the associated costs equally. The District and Contractor shall mutually agree to a mediator within ten (10) business days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the Claim remaining in dispute shall be subject to applicable procedures outside this section.

25.5.3.1.1 For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

25.5.3.2 Unless otherwise agreed to by the District and Contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Public Contract Code section 20104.4 to mediate after litigation has been commenced.

25.5.4 STEP 4:

25.5.4.1 If mediation under this section does not resolve the parties' dispute, the District may, but does not require arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program.

25.6 <u>Subcontractor Pass-Through Claims</u>

25.6.1 If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a District because privity of contract does not exist, the contractor may present to the District a Claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that Contractor present a Claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the Claim be

presented to the District shall furnish reasonable documentation to support the Claim.

25.6.2 Within forty-five (45) days of receipt of this written request from a subcontractor, Contractor shall notify the subcontractor in writing as to whether the Contractor presented the Claim to the District and, if Contractor did not present the Claim, provide the subcontractor with a statement of the reasons for not having done so.

25.6.3 The Contractor shall bind all its Subcontractors to the provisions of this section and will hold the District harmless against Claims by Subcontractors.

25.7 Government Code Claim Act Claim

25.7.1 If a claim, or any portion thereof, remains in dispute upon satisfaction of all applicable Claim Resolution requirements the Contractor shall comply with all claims presentation requirements as provided in Chapter 1 (commencing with section 900) and Chapter 2 (commencing with section 910) of Part 3 of Division 3.6 of Title 1 of Government Code as a condition precedent to the Contractor's right to bring a civil action against the District.

25.7.2 Contractor shall bear all costs incurred in the preparation, submission and administration of a Claim. Any claims presented in accordance with the Government Code must affirmatively indicate Contractor's prior compliance with the claims procedure herein of the claims asserted.

25.7.3 For purposes of those provisions, the running of the time within which a claim pursuant to Public Contract Code section 20104.2 only must be presented to the District shall be tolled from the time the claimant submits his or her written claim until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

25.8 Claim Resolution pursuant to Public Contract Code section 20104 et seq.

25.8.1 In the event of a disagreement between the parties as to performance of the Work, the interpretation of this Contract, or payment or nonpayment for Work performed or not performed, the parties shall attempt to resolve all claims of three hundred seventy-five thousand dollars ($375,000) or less which arise between Contractor and District by those procedures set forth in Public Contract Code section 20104, et seq., to the extent applicable.

25.8.1.1 Contractor shall file with the District any written Claim, including the documents necessary to substantiate it, upon the application for final payment.

25.8.1.2 For claims of less than fifty thousand dollars ($50,000), the District shall respond in writing within forty-five (45) days of receipt of the Claim or may request in writing within thirty (30) days of receipt of the Claim any additional documentation supporting the Claim or relating to defenses or claims the District may have against the Contractor.

25.8.1.2.1 If additional information is required, it shall be requested and provided by mutual agreement of the parties.

25.8.1.2.2 District's written response to the documented Claim shall be submitted to the Contractor within fifteen (15) days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor to produce the additional information, whichever is greater.

25.8.1.3 For claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the District shall respond in writing to all written Claims within sixty (60) days of receipt of the claim, or may request, in writing, within thirty (30) days of receipt of the Claim any additional documentation supporting the Claim or relating to defenses or claims the District may have against the Contractor.

25.8.1.3.1 If additional information is required, it shall be requested and provided upon mutual agreement of the District and the Contractor.

25.8.1.3.2 The District's written response to the Claim, as further documented, shall be submitted to the Contractor within thirty (30) days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor to produce the additional information or requested documentation, whichever is greater.

25.8.1.4 If Contractor disputes the District's written response, or the District fails to respond within the time prescribed, Contractor may so notify the District, in writing, either within fifteen (15) days of receipt of the District's response or within fifteen (15) days of the District's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the District shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

25.8.1.5 Following the meet and confer conference, if the Claim or any portion of it remains in dispute, the Contractor may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions the running of the time within which a claim must be filed shall be tolled from the time the Contractor submits its written Claim until the time the Claim is denied, including any period of time utilized by the meet and confer process.

25.8.1.6 For any civil action filed to resolve claims filed pursuant to this section, within sixty (60) days, but no earlier than thirty (30) days, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within fifteen (15) days by both parties of a disinterested third person as mediator, shall be commenced within thirty (30) days of the submittal, and shall be concluded within fifteen (15) days from the commencement of the mediation unless a time requirement is extended upon a

good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

25.8.1.7 If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of the Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986, (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

25.8.1.8 The District shall not fail to pay money as to any portion of a Claim which is undisputed except as otherwise provided in the Contract Documents. In any suit filed pursuant to this section, the District shall pay interest due at the legal rate on any arbitration award or judgment. Interest shall begin to accrue on the date the suit is filed in a court of law.

25.8.2 Contractor shall bind its Subcontractors to the provisions of this Article and will hold the District harmless against disputes by Subcontractors.

25.9 Claim Procedure Compliance

25.9.1 Failure to submit and administer claims as required in Article 25 shall waive Contractor's right to claim on any specific issues not included in a timely submitted claim. Claim(s) not raised in a timely protest and timely claim submitted under this Article 25 may not be asserted in any subsequent litigation, Government Code Claim, or legal action.

25.9.2 District shall not be deemed to waive any provision under this Article 25, if at District's sole discretion, a claim is administered in a manner not in accord with this Article 25. Waivers or modifications of this Article 25 may only be made by a signed change order approved as to form by legal counsel for both District and Contractor; oral or implied modifications shall be ineffective.

25.10 Claim Resolution Non-Applicability

25.10.1 The procedures for dispute and claim resolutions set forth in this Article shall not apply to the following:

25.10.1.1 Personal injury, wrongful death or property damage claims;

25.10.1.2 Latent defect or breach of warranty or guarantee to repair;

25.10.1.3 Stop payment notices;

25.10.1.4 District's rights set forth in the Article on Suspension and Termination;

25.10.1.5 Disputes arising out of labor compliance enforcement by the Department of Industrial Relations; or

25.10.1.6 District rights and obligations as a public entity set forth in applicable statutes; provided, however, that penalties imposed against a public entity by statutes, including, but not limited to, Public Contract Code sections 20104.50 and 7107, shall be subject to the Claim Resolution requirements provided in this Article.

25.11 Attorney's Fees

25.11.1 Should litigation be necessary to enforce any terms or provisions of this Agreement, then each party shall bear its own litigation and collection expenses, witness fees, court costs, and attorney's fees.

26. STATE LABOR, WAGE & HOUR, APPRENTICE, AND RELATED PROVISIONS

26.1 Labor Compliance and Enforcement

Since this Project is subject to labor compliance and enforcement by the Department of Industrial Relations ("DIR"), Contractor specifically acknowledges and understands that it shall perform the Work of this Agreement while complying with all the applicable provisions of Division 2, Part 7, Chapter 1, of the Labor Code and Title 8 of the California Code of Regulations, including, without limitation, the requirement that the Contractor and all Subcontractors shall timely furnish complete and accurate electronic certified payroll records directly to the DIR. The District may not issue payment if this requirement is not met.

26.2 Wage Rates, Travel, and Subsistence

26.2.1 Pursuant to the provisions of Article 2 (commencing at section 1770), Chapter 1, Part 7, Division 2, of the Labor Code, the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft, classification, or type of worker needed to execute this Contract are on file at the District's principal office and copies will be made available to any interested party on request or available online at http://www.dir.ca.gov/. Contractor shall obtain and post a copy of these wage rates at the job site.

26.2.2 Holiday and overtime work, when permitted by law, shall be paid for at the general prevailing rate of per diem wages for holiday and overtime work on file with the Director of the Department of Industrial Relations, unless otherwise specified. The holidays upon which those rates shall be paid need not be specified by the District but shall be all holidays recognized in the applicable collective bargaining agreement. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code.

26.2.3 Contractor shall pay and shall cause to be paid each worker engaged in Work on the Project the general prevailing rate of per diem wages determined by the Director of the Department of Industrial Relations, regardless of any contractual relationship which may be alleged to exist between Contractor or any Subcontractor and such workers.

26.2.4 If during the period this bid is required to remain open, the Director of the Department of Industrial Relations determines that there has been a change in any prevailing rate of per diem wages in the locality in which the Work under the Contract is to be performed, such change shall not alter the wage rates in the Notice to Bidders or the Contract subsequently awarded.

26.2.5 Pursuant to Labor Code section 1775, Contractor shall, as a penalty to District, forfeit the statutory amount up to two hundred dollars ($200) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates, determined by the District and/or the Director, for the work or craft in which that worker is employed for any public work done under Contract by Contractor or by any Subcontractor under it. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by Contractor.

26.2.6 Any worker employed to perform Work on the Project, which Work is not covered by any classification listed in the general prevailing wage rate of per diem wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to Work to be performed by him, and such minimum wage rate shall be retroactive to time of initial employment of such person in such classification.

26.2.7 Pursuant to Labor Code section 1773.1, per diem wages are deemed to include employer payments for health and welfare, pension, vacation, travel time, subsistence pay, and apprenticeship or other training programs authorized by Labor Code section 3093, and similar purposes.

26.2.8 Contractor shall post at appropriate conspicuous points on the Site of Project, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned. In addition, Contractor shall post a sign-in log for all workers and visitors to the Site, a list of all subcontractors of any tier on the Site, and the required Equal Employment Opportunity poster(s).

26.3 Hours of Work

26.3.1 As provided in article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code, eight (8) hours of labor shall constitute a legal day's work. The time of service of any worker employed at any time by Contractor or by any Subcontractor on any subcontract under this Contract upon the Work or upon any part of the Work contemplated by this Contract shall be limited and restricted by Contractor to eight (8) hours per day, and forty (40) hours during any one week, except as hereinafter provided. Notwithstanding the provisions hereinabove set forth, Work performed by employees of Contractor in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon this public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.

26.3.2 Contractor shall keep and shall cause each Subcontractor to keep an accurate record showing the name of and actual hours worked each calendar day

and each calendar week by each worker employed by Contractor in connection with the Work or any part of the Work contemplated by this Contract. The record shall be kept open at all reasonable hours to the inspection of District and to the Division of Labor Standards Enforcement of the DIR.

26.3.3 Pursuant to Labor Code section 1813, Contractor shall as a penalty to the District forfeit the statutory amount (believed by the District to be currently twenty-five dollars ($25)) for each worker employed in the execution of this Contract by Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of the provisions of article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code.

26.3.4 Any Work necessary to be performed after regular working hours, or on Sundays or other holidays shall be performed without additional expense to the District.

26.4 Payroll Records

26.4.1 Contractor shall upload, and shall cause each Subcontractor performing any portion of the Work under this Contract to upload, an accurate and complete certified payroll record ("CPR") electronically using DIR's eCPR System by uploading the CPRs by electronic XML file or entering each record manually using the DIR's iform (or current form) online on no less than every thirty (30) days while Work is being performed and within thirty (30) days after the final day of Work performed on the Project and within ten (10) days of any request by the District or Labor Commissioner at http://www.dir.ca.gov/Public-Works/Certified-Payroll-Reporting.html or current application and URL, 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 journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work.

26.4.1.1 The CPRs enumerated hereunder shall be filed directly with the DIR on a weekly basis or to the requesting party, whether the District or DIR, within ten (10) days after receipt of each written request. The CPRs from the Contractor and each Subcontractor for each week shall be provided on or before Wednesday of the week following the week covered by the CPRs. District may not make any payment to Contractor until:

26.4.1.1.1 Contractor and/or its Subcontractor(s) provide CPRs acceptable to the DIR; and

26.4.1.1.2 Any delay in Contractor and/or its Subcontractor(s) providing CPRs to the DIR in a timely manner may directly delay Contractor's payment.

26.4.2 All CPRs shall be available for inspection at all reasonable hours at the principal office of Contractor on the following basis:

26.4.2.1 A certified copy of an employee's CPR shall be made available for inspection or furnished to the employee or his/her authorized representative on request.

26.4.2.2 CPRs shall be made available for inspection or furnished upon request to a representative of District, Division of Labor Standards Enforcement, Division of Apprenticeship Standards, and/or the DIR.

26.4.2.3 CPRs shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through the District, Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested CPRs have not been provided pursuant to the provisions herein, the requesting party shall, prior to being provided the records, reimburse the costs of preparation by Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of Contractor.

26.4.3 Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by District, Division of Apprenticeship Standards, or 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 Contractor awarded Contract or performing Contract shall not be marked or obliterated.

26.4.4 Contractor shall inform District of the location of the records enumerated hereunder, including the street address, city, and county, and shall, within five (5) working days, provide a notice of change of location and address.

26.4.5 In the event of noncompliance with the requirements of this section, Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying in what respects Contractor must comply with this section. Should noncompliance still be evident after the ten (10) day period, Contractor shall, as a penalty to District, forfeit up to one hundred dollars ($100) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Labor Commissioner, these penalties shall be withheld from progress payments then due.

26.4.6 [RESERVED]

26.5 [RESERVED]

26.6 Apprentices

26.6.1 Contractor acknowledges and agrees that, if this Contract involves a dollar amount greater than, or a number of working days greater than that specified in Labor Code section 1777.5, then this Contract is governed by the provisions of Labor Code Section 1777.5. It shall be the responsibility of Contractor to ensure compliance with this Article and with Labor Code section 1777.5 for all apprenticeship occupations.

26.6.2 Apprentices of any crafts or trades may be employed and, when required by Labor Code section 1777.5, shall be employed provided they are properly registered in full compliance with the provisions of the Labor Code.

26.6.3 Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he/she/they is employed, and shall be employed only at the work of the craft or trade to which he/she/they is registered.

26.6.4 Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprentice agreements under chapter 4 (commencing at section 3070), division 3, of the Labor Code, are eligible to be employed. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he/she/they is training.

26.6.5 Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractors employing workers in any apprenticeable craft or trade in performing any Work under this Contract shall apply to the applicable joint apprenticeship committee for a certificate approving the Contractor or Subcontractor under the applicable apprenticeship standards and fixing the ratio of apprentices to journeymen employed in performing the Work.

26.6.6 Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractor may be required to make contributions to the apprenticeship program.

26.6.7 If Contractor or Subcontractor willfully fails to comply with Labor Code section 1777.5, then, upon a determination of noncompliance by the Administrator of Apprenticeship, it shall:

26.6.7.1 Be denied the right to bid on any subsequent project for one (1) year from the date of such determination;

26.6.7.2 Forfeit as a penalty to District the full amount as stated in Labor Code section 1777.7. Interpretation and enforcement of these provisions shall be in accordance with the rules and procedures of the California Apprenticeship Council and under the authority of the Chief of the Division of Apprenticeship Standards.

26.6.8 Contractor and all Subcontractors shall comply with Labor Code section 1777.6, which section forbids certain discriminatory practices in the employment of apprentices.

26.6.9 Contractor shall become fully acquainted with the law regarding apprentices prior to commencement of the Work. Special attention is directed to sections 1777.5, 1777.6, and 1777.7 of the Labor Code, and title 8, California Code of Regulations, section 200 et seq. Questions may be directed to the State Division of Apprenticeship Standards, 455 Golden Gate Avenue, 9th floor, San Francisco, California 94102.

26.7 Non-Discrimination

26.7.1 Contractor herein agrees to comply with the provisions of the California Fair Employment and Housing Act as set forth in part 2.8 of division 3 of the California Government Code, commencing at section 12900; the Federal Civil Rights Act of 1964, as set forth in Public Law 88-352, and all amendments thereto; Executive Order 11246; and all administrative rules and regulations found to be applicable to Contractor and Subcontractor.

26.7.2 Special requirements for Federally Assisted Construction Contracts: During the performance of this Contract, Contractor agrees to incorporate in all subcontracts the provisions set forth in Chapter 60-1.4(b) of Title 41 published in Volume 33 No. 104 of the Federal Register dated May 28, 1968.

26.8 Labor First Aid

Contractor shall maintain emergency first aid treatment for Contractor's workers on the Project which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.) and the California Occupational Safety and Health Act of 1973 (Lab. Code, § 6300 et seq.; 8 Cal. Code of Regs., § 330 et seq.).

27. [RESERVED]

28. MISCELLANEOUS

28.1 Assignment of Antitrust Actions

28.1.1 Section 7103.5(b) of the Public Contract Code states:

In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commending with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, which assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

28.1.2 Section 4552 of the Government Code states:

In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

28.1.3 Section 4553 of the Government Code states:

If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

28.1.4 Section 4554 of the Government Code states:

Upon demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under this part if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action.

28.1.5 Under this Article, "public purchasing body" is District and "bidder" is Contractor.

28.2 Excise Taxes

If, under Federal Excise Tax Law, any transaction hereunder constitutes a sale on which a Federal Excise Tax is imposed and the sale is exempt from such Federal Excise Tax because it is a sale to a State or Local Government for its exclusive use, District, upon request, will execute documents necessary to show (1) that District is a political subdivision of the State for the purposes of such exemption, and (2) that the sale is for the exclusive use of District. No Federal Excise Tax for such materials shall be included in any Contract Price.

28.3 Taxes

Contract Price is to include any and all applicable sales taxes or other taxes that may be due in accordance with section 7051 et seq. of the Revenue and Taxation Code, Regulation 1521 of the State Board of Equalization or any other tax code that may be applicable.

28.4 Shipments

Contractor is responsible for any or all damage or loss to shipments until delivered and accepted on Site, as indicated in the Contract Documents. There must be no charge for containers, packing, unpacking, drayage, or insurance. The total Contract Price shall be all inclusive (including sales tax) and no additional costs of any type will be considered.

28.5 Compliance with Government Reporting Requirements

If this Contract is subject to federal or other governmental reporting requirements because of federal or other governmental financing in whole or in part for the Project of which it is part, or for any other reason, Contactor shall comply with those reporting requirements at the request of the District at no additional cost.

END OF DOCUMENT

DOCUMENT 00 73 13
SPECIAL CONDITIONS

THIS DOCUMENT MUST BE ADAPTED FOR EACH PROJECT – Delete any provision that is not applicable or if no change from the provision in the General Conditions.

***** THIS LIST OF SPECIAL CONDITION PROVISIONS IS FOR REFERENCE ONLY. REMOVE THIS PAGE BEFORE USING THIS DOCUMENT. *****

1. Preparation of Solicitation for Subsequent Contracts
2. Mitigation Measures
3. Modernization Projects
4. Badge Policy for Contractors
5. Substitution for Specified Items
6. Weather Days
7. Owner-Controlled or Wrap-Up Insurance Program
8. Insurance Policy Limits
9. Permits, Certificates, Licenses, Fees, Approval
10. Project Labor Agreement/Payroll Records
11. As-Builts and Record Drawings
12. Disabled Veteran Business Enterprises
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19. Federal Funds - Domestic preferences for procurements
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DOCUMENT 00 73 13
SPECIAL CONDITIONS

1. Preparation of Solicitation of Subsequent Contracts

Insert Section 6.1.9 in the General Conditions:

6.1.9 Contractor's duties and services under this Contract shall not include preparing or assisting the District with any portion of the District's preparation of a request for proposals, request for qualifications, or any other solicitation regarding a subsequent or additional contract with the District. The District shall at all times retain responsibility for public contracting, including with respect to any subsequent phase of this Project. Contractor's participation in the planning, discussions, or drawing of project plans or specifications shall be limited to conceptual, preliminary, or initial plans or specifications. Contractor shall cooperate with the District to ensure that all bidders for a subsequent contract on any subsequent phase of this Project have access to the same information, including all conceptual, preliminary, or initial plans or specifications prepared by Contractor pursuant to this Contract.

2. Mitigation Measures

The Contractor shall comply with all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.).

3. Modernization Projects

3.1 Access. Access to the school buildings and entry to buildings, classrooms, restrooms, mechanical rooms, electrical rooms, or other rooms, for construction purposes, must be coordinated with District and onsite District personnel before Work is to start. Unless agreed to otherwise in writing, only a school custodian will be allowed to unlock and lock doors in existing building(s). The custodian will be available only while school is in session. If a custodian is required to arrive before 7:00 a.m. or leave after 3:30 p.m. to accommodate Contractor's Work, the overtime wages for the custodian will be paid by the Contractor, unless at the discretion of the District, other arrangements are made in advance.

3.2 Keys. Upon request, the District may, at its own discretion, provide keys to the school site for the convenience of the Contractor. The Contractor agrees to pay all expenses to re-key the entire school site and all other affected District buildings if the keys are lost or stolen, or if any unauthorized party obtains a copy of the key or access to the school.

3.3 Maintaining Services. The Contractor is advised that Work is to be performed in spaces regularly scheduled for instruction. Interruption and/or periods of shutdown of public access, electrical service, water service, lighting, or other utilities shall be only as arranged in advance with the District. Contractor shall provide temporary services to all facilities interrupted by Contractor's Work.

3.4 Maintaining Utilities. The Contractor shall maintain in operation during duration of Contract, drainage lines, storm drains, sewers, water, gas, electrical, steam, and other utility service lines within working area.

3.5 Confidentiality. Contractor shall maintain the confidentiality of all information, documents, programs, procedures and all other items that Contractor encounters while performing the Work. This requirement shall be ongoing and shall survive the expiration or termination of this Contract and specifically includes, without limitation, all student, parent, and employee disciplinary information and health information.

3.6 Work during Instructional Time. By submitting its bid, Contractor affirms that Work may be performed during ongoing instruction in existing facilities. If so, Contractor agrees to cooperate to the best of its ability to minimize any disruption to school operations and any use of school facilities by the public up to, and including, rescheduling specific work activities, at no additional cost to District.

3.7 No Work during Student Testing. Contractor shall, at no additional cost to the District and at the District's request, coordinate its Work to not disturb District students including, without limitation, not performing any Work when students at the Site are taking State or Federally-required tests.

4. Badge Policy for Contractors

All Contractors doing work for the District will provide their workers with identification badges. These badges will be worn by all members of the Contractor's staff who are working in a District facility.

4.1 Badges must be filled out in full and contain the following information:

4.1.1 Name of Contractor

4.1.2 Name of Employee

4.1.3 Contractor's address and phone number

4.2 Badges are to be worn when the Contractor or his/her employees are on site and must be visible at all times. Contractors must inform their employees that they are required to allow District employees, the Architect, the Construction Manager, the Program Manager, or the Project Inspector to review the information on the badges upon request.

4.3 Continued failure to display identification badges as required by this policy may result in the individual being removed from the Project or assessment of fines against the Contractor.

5. Substitutions for Specified Items

Replace Section 1.7 in the General Conditions with the following provisions:

1.7.1 Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words "or equal." Contractor may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified.

1.7.1.1 If the material, process, or article offered by Contractor is not, in the opinion of the District, substantially equal or better in every respect to that specified, then Contractor shall furnish the material, process, or article specified in the Specifications without any additional compensation or change order.

1.7.1.2 This provision shall not be applicable with respect to any material, product, thing or service for which District made findings and gave notice in accordance with Public Contract Code section 3400(c); therefore, Contractor shall not be entitled to request a substitution with respect to those materials, products or services.

1.7.2 A request for a substitution shall be submitted as follows:

1.7.2.1 Contractor shall notify the District in writing of any request for a substitution at least ten (10) days prior to bid opening as indicated in the Instructions to Bidders.

1.7.2.2 Requests for Substitutions after award of the Contract shall be submitted within thirty-five (35) days of the date of the Notice of Award.

1.7.3 Within 35 days after the date of the Notice of Award, Contractor shall provide data substantiating a request for substitution of "an equal" item, including but not limited to the following:

1.7.3.1 All variations of the proposed substitute from the material specified including, but not limited to, principles of operation, materials, or construction finish, thickness or gauge of materials, dimensions, weight, and tolerances;

1.7.3.2 Available maintenance, repair or replacement services;

1.7.3.3 Increases or decreases in operating, maintenance, repair, replacement, and spare parts costs;

1.7.3.4 Whether or not acceptance of the substitute will require other changes in the Work (or in work performed by the District or others under Contract with the District); and

1.7.3.5 The time impact on any part of the Work resulting directly or indirectly from acceptance of the proposed substitute.

1.7.4 No substitutions shall be made until approved, in writing, by the District. The burden of proof as to equality of any material, process, or article shall rest with Contractor. The Contractor warrants that if substitutes are approved:

1.7.4.1 The proposed substitute is equal or superior in all respects to that specified, and that such proposed substitute is suitable and fit for the intended purpose and will perform adequately the function and achieve the results called for by the general design and the Contract Documents;

1.7.4.2 The Contractor provides the same warranties and guarantees for the substitute that would be provided for that specified;

1.7.4.3 The Contractor shall be fully responsible for the installation of the substitute and any changes in the Work required, either directly or indirectly, because of the acceptance of such substitute, with no increase in Contract Price or Contract Time. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time;

1.7.4.4 The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute; and

1.7.4.5 The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit.

1.7.5 In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.

1.7.6 In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

1.7.7 Contractor shall be responsible for any costs the District incurs for professional services, DSA fees, or delay to the Project Schedule, if applicable, while DSA reviews changes for the convenience of Contractor and/or to accommodate Contractor's means and methods. District may deduct those costs from any amounts owing to the Contractor for the review of the request for substitution, even if the request for substitution is not approved. District, at its sole discretion, shall deduct from the payments due to and/or invoice Contractor for all the professional services and/or DSA fees or delay to the Project Schedule, if applicable, while DSA reviews changes for the convenience of Contractor and/or to accommodate Contractor's means and methods arising herein.

6. Weather Days

Replace Section 15.2.1.5 in the General Conditions with the following:

15.2.1.5 The number of days of Adverse Weather exceeds the following parameters:

January		July	
February		August	
March		September	
April		October	
May		November	
June		December	

7. Owner-Controlled or Wrap-Up Insurance Program

If the District opts to implement an owner-controlled or wrap-up insurance program ("OCIP"), Contractor and all Subcontractors under the Contractor shall participate in and comply with the OCIP as required by the District, OCIP Administrator, insurers, or designees, prior to the commencement of construction activities at the Project. In addition, Contractor shall procure and maintain, at its own expense, until completion and final acceptance of the Work at least the following insurance from insurance companies with an A.M. Best rating of no less than _____, except for those coverages provided by the OCIP as described in the OCIP Manual:

[Commercial General Liability]	Personal Injury Liability, Broad Form Property Damage including completed operations, and Explosion, Collapse and Underground Hazards	**[E.G. $5,000,000]**
[Automobile Liability – Any Auto]	Bodily Injury and Property Damage	**[E.G. $5,000,000]**
[Workers Compensation]		Statutory limits pursuant to State law
[Employers' Liability]		**[E.G. $1,000,000]**

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8. Insurance Policy Limits

All of Contractor's insurance shall be with insurance companies with an A.M. Best rating of no less than _____. The limits of insurance shall not be less than:

Commercial General Liability	Product Liability and Completed Operations, Fire Damage Liability – Split Limit	**[E.G. CHOOSE ONE OF THREE OPTIONS:** Option 1 - Low Risk Option: $1,000,000 per occurrence; $2,000,000 aggregate
		Option 2 - Intermediate Risk Option: $2,000,000 per occurrence; $4,000,000 aggregate
		Option 3 - High Risk Option: $5,000,000 per occurrence; $10,000,000 aggregate**]**
Automobile Liability – Any Auto	Combined Single Limit	**[E.G. CHOOSE ONE OF TWO OPTIONS:** Option 1 - Personal vehicles: $500,000 Commercial vehicles: $1,000,000
		Option 2 - Personal vehicles: $100,000 per person/ $300,000 per accident**]**
Workers' Compensation		Statutory limits pursuant to State law
Employer's Liability		**[E.G. $0]**
Builder's Risk (Course of Construction)		**[E.G. $0]**
Pollution Liability		**[E.G. $0]**

9. Permits, Certificates, Licenses, Fees, Approvals

9.1 Payment for Permits, Certificates, Licenses, Fees, and Approvals. As required in the General Conditions, the Contractor shall secure and pay for all permits, licenses,

approvals, and certificates necessary for the prosecution of the Work with the exception of the following:

[_____]

With respect to the above-listed items, Contractor shall be responsible for securing such items; however, District will be responsible for payment of these charges or fees. Contractor shall notify the District of the amount due with respect to such items and to whom the amount is payable. Contractor shall provide the District with an invoice and receipt with respect to such charges or fees.

9.2 General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities

General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities does not apply to this Project.

10. Project Labor Agreement/Payroll Records

The District reserves the right to enter into a Project Labor Agreement ("PLA") related to this Project.

Accordingly, the following provision may be added as Section 26.4.6 :

26.4.6 As Contractor and its subcontractors have agreed to be bound by the terms of the PLA entered into by the District [on or about / dated] _____, Contractor and its subcontractors may be excused from uploading CPRs electronically using DIR's eCPR System by uploading the CPRs by electronic XML file or entering each record manually using the DIR's iform (or current form) online at http://www.dir.ca.gov/Public-Works/Certified-Payroll-Reporting.html , or by using a more current application and URL. However, within ten (10) days of any request by the District or Labor Commissioner, Contractor and its subcontractors shall provide CPRs 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 journeyman, apprentice, worker, or other employee employed by the Contractor and/or each subcontractor in connection with the Work.

11. As-Builts and Record Drawings

11.1 When called for by Division 1, Contractor shall submit As-Built Drawings pursuant to the Contract Documents consisting of one set of computer-aided design and drafting ("CADD") files in the following format _____, plus one set of As-Built Drawings on vellum or mylar.

11.2 Contractor shall submit Record Drawings pursuant to the Contract Documents consisting of one set of computer-aided design and drafting ("CADD") files in the following format _____, plus one set of Record Drawings on vellum or mylar.

12. Disabled Veteran Business Enterprises

This Project may use or plan to use funds allocated pursuant to the State of California School Facility Program ("Program") for the construction and/or modernization of school buildings. Therefore, Section 17076.11 of the Education Code requires the District to have a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%), per year, of the overall dollar amount expended each year by the District on projects that receive state funding. The Contractor must submit the Disabled Veteran Business Enterprise Participation Certification to the District with its executed Agreement, identifying the steps Contractor took to solicit DVBE participation in conjunction with this Contract.

In instances where this Project does not utilize funds allocated by the State of California School Facility Program for the construction and/or modernization of school buildings, the above-stated DVBE participation goals and certification requirements shall not apply.

13. Construction Manager

The District will use a Construction Manager on the Project that is the subject of this Contract. _____ is the Construction Manager for this Project.

14. Program Manager

_____ is the Program Manager designated for the Project that is the subject of this Contract.

15. Federal Funds - Wages

As this Project is funded in whole or in part by federal funds, Contractor and all Subcontractors are subject to civil or criminal prosecution for any violation of the federal False Claims Act set forth under section 1001 of title 18 and section 231 of title 31 of the United States Code.

If federal funding is utilized, in whole or in part, then the following provisions are added as Section 27 of the General Conditions:

27. FEDERAL LABOR, WAGE & HOUR, APPRENTICE, AND RELATED PROVISIONS

27.1 Minimum Wages

The Davis-Bacon Act and 29 CFR parts 1 through 7 shall apply if the Project is financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution.

27.1.1 All laborers and mechanics employed or working upon the Site of the Work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the Project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account, except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3) , the full amount of wages and bona fide fringe benefits,

or cash equivalents thereof, due at time of payment computed at rates not less than those contained in the applicable wage determination of the Secretary of Labor regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of this section, including but not limited to paragraph 27.1.7; also, regular contributions made or costs incurred for more than a weekly period, but not less often than quarterly, under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of Work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing Work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which Work is performed. The wage determination including any additional classification and wage rates conformed under this section, including but not limited to paragraph 27.1.6 and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its Subcontractors at the Site of the Work in a prominent and accessible place where it can be easily seen by the workers.

27.1.2 Any class of laborers or mechanics, including helpers, and which is to be employed under the Contract which is not listed in the wage determination shall be classified in conformance with the wage determination. An additional classification and wage rate and fringe benefits will not be approved unless when the following criteria have been met:

27.1.2.1 The Work to be performed by the classification requested is not performed by a classification in the wage determination; and

27.1.2.2 The classification is utilized in the area by the construction industry; and

27.1.2.3 The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

27.1.3 If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the District agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the Contractor to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210.

27.1.4 In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the District do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contractor shall provide the questions, including the views of all interested parties and the recommendation of the District, to the District for the District's review and referral to the Administrator for determination.

27.1.5 The wage rate (including fringe benefits where appropriate) determined pursuant to this section, shall be paid to all workers performing Work in the classification under this Contract from the first day on which Work is performed in the classification.

27.1.6 Whenever the minimum wage rate prescribed in any applicable wage determination for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

27.1.7 If the Contractor does not make payments to a trustee or other third person, the Contractor may consider, as part of the wages of any laborer or mechanic, the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. If the Secretary of Labor so requires, the Contractor shall set aside in a separate account sufficient assets to meet obligations under the plan or program.

27.2 Withholding. District may, upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this Contract or any other Federal contract with the same Contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any Subcontractor the full amount of wages required by the Contract. In the event of Contractor's or any Subcontractors' failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the Site of the Work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the Contract, the District may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as it deems necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

27.3 Payrolls and basic records.

27.3.1 Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the Work and preserved for a period of three years thereafter for all laborers and mechanics working at the Site of the

Work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records that show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

27.3.2 The Contractor shall submit weekly for each week in which any Contract Work is performed a copy of all payrolls to the District. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information shall be submitted on a form acceptable to the District. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at https://www.dol.gov/whd/programs/dbra/wh347.htm or its successor site. Contractor is responsible for the submission of copies of payrolls by all Subcontractors. Contractor and Subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the District, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. Contractor may require a Subcontractor to provide addresses and social security numbers to the Contractor for its own records, without weekly submission to the District or other government agency

27.3.3 Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or Subcontractor or his or her agent who pays or supervises the payment of the persons employed under the Contract and shall certify the following:

27.3.3.1 That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5,

27.3.3.2 That the appropriate information is being maintained under 29 CFR 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and

27.3.3.3 That such information is correct and complete;

27.3.3.4 That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the Contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and

27.3.3.5 That no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

27.3.3.6 That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of Work performed, as specified in the applicable wage determination incorporated into or applicable to the Contract.

27.3.3.7 The weekly submission of a properly executed certification in the form set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 27.3.3 of this section.

27.3.3.8 The falsification of any of the above certifications may subject the Contractor or one or more Subcontractors to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

27.3.3.9 The Contractor or Subcontractor shall make the records required under this section available for inspection, copying, or transcription by authorized representatives of the District or the federal Department of Labor, and shall permit representatives to interview employees during working hours on the job. If the Contractor or Subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

27.4 Apprentices and trainees

27.4.1 Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the Work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if

a person is employed in his or her first ninety (90) days of probationary employment as an apprentice in an eligible apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job Site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of Work actually performed. In addition, any apprentice performing Work on the job Site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the Work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or Subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the Work performed until an acceptable program is approved.

27.4.2 Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to Work at less than the predetermined rate for the Work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job Site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the

wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of Work actually performed. In addition, any trainee performing Work on the job Site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the Work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the Work performed until an acceptable program is approved.

27.4.3 Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

27.5 Compliance with Copeland Act requirements. Contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this Contract.

27.6 Subcontracts. The Contractor or Subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the Federal agency may by appropriate instructions require, and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The Contractor shall be responsible for the compliance by any Subcontractor or lower tier Subcontractor with all the Contract clauses in 29 CFR 5.5.

27.7 Contract termination: debarment. A breach of the Contract clauses in 29 CFR 5.5 may be grounds for termination of the Contract, and for debarment as a Contractor and a Subcontractor as provided in 29 CFR 5.12.

27.8 Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this Contract.

27.9 Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this Contract shall not be subject to the general disputes clause of this Contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its Subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

27.10 Certification of eligibility.

27.10.1 By entering into this Contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's

firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

27.10.2 No part of this Contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

27.10.3 Contractor shall be subject to the penalty for making false statements prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

27.11 Clauses Mandated by Contract Work Hours and Safety Standards Act.

As used in the following paragraphs, the terms laborers and mechanics include watchmen and guards.

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

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

27.11.3 Withholding for unpaid wages and liquidated damages. The District may upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of Work performed by the Contractor or Subcontractor under the Contract or any other Federal contract with the same Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the forgoing paragraph.

27.11.4 Subcontracts. The Contractor or Subcontractor shall insert in any subcontracts the foregoing paragraphs concerning "Overtime requirements" and "Violation; liability for unpaid wages; liquidated damages" and also a clause requiring each Subcontractor to include these clauses in any lower tier subcontracts. Contractor shall be responsible for compliance by any Subcontractor or lower tier Subcontractor with the clauses set forth in paragraphs 27.11.1 through 27.11.4 of this section.

16. Federal Funds – Debarment

If the Project is funded in whole or in part by federal funds, then the following provision is added as Section 6.1.5 of the General Conditions:

This Project uses or may plan to use federal funds. Consequently, Contractor is required to provide a signed "Federal Debarment" certification with its bid. This certification is required by the regulation implementing Executive Order 12549, Debarment and Suspension, 29 CFR Part 89, Section 98.510, Participants; responsibilities. The regulations were published as Part of VII of the May 26, 1988 Federal Register (pages 19160-19211).

17. Federal Funds – Byrd Anti-Lobbying

If the Project is funded in whole or in part by federal funds, then the following provision is added as Section 6.1.7 of the General Conditions:

If the contract exceeds $100,000, Contractor is required to provide a signed "Byrd Anti-Lobbying" certification with its bid ((31 U.S.C. 1352) (Appendix II to 2 CFR, Part 200)).

18. Federal Funds – Procurement of recovered materials

If the Project is funded in whole or in part by federal funds, then the following provision is added as Section 6.13.5 of the General Conditions:

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

19. Federal Funds - Domestic preferences for procurements

If the Project is funded in whole or in part by a federal grant made after November 12, 2020, then the following provision is added as Section 1.8.10 of the General Conditions:

1.8.10 As appropriate and to the extent consistent with law, Contractor should, to the greatest extent practicable for the Project, provide a preference for the purchase,

acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subcontracts and purchase orders for work or products for the Project.

1.8.10.1 "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

1.8.10.2 "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

20. Preliminary Schedule of Values

The preliminary schedule of values shall include, at a minimum, the following information and the following structure:

Replace Section 10.1.1.2.3 in the General Conditions with the following provisions:

10.1.1.2.3 The preliminary schedule of values shall not provide for values any greater than the following percentages of the Contract value:

10.1.1.2.3.1 Mobilization and layout combined to equal not more than [2]%;

10.1.1.2.3.2 Submittals, samples and shop drawings combined to equal not more than [4]%;

10.1.1.2.3.3 Bonds and insurance combined to equal not more than [2.75]%.

10.1.1.2.3.4 Closeout documentation shall have a value in the preliminary schedule of not less than [5]%.

DOCUMENT 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Site Access Conditions and Requirements;

B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of this Contract consists of the following:

Selective demolition and construction necessary for the Modernization to existing school buildings, including associated civil, architectural, structural, plumbing, mechanical and/or electrical work as indicated in the Drawings and Specifications. Generally, these categories of work involve new finishes, adaptive re-use and modification of certain selected areas, new cabinetry, handicap accessibility retrofits, re-roofing, and adding HVAC to instructional areas, library and administrative areas and pertain to changing and expanding selected infrastructure utilities, and extensive modifications. Project also includes (1) new shade structure and (1) new modular building consisting of (4) classrooms. The Project will involve the "phasing" and barricading of work areas as indicated on the Plans and enumerated in these Specifications.

1.03 CONTRACTS

A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

A. Work on the Project that will be performed and completed prior to the start of the Work of this Contract:

[FILL IN OR MODIFY AS APPROPRIATE]

(1) Asbestos removal/abatement.

(2) Lead paint removal/abatement.

B. Work on the Project that will be performed by others concurrent with the Work of this Contract:

(1) _____

(2) _____

1.05 CODES, REGULATIONS, AND STANDARDS

A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.

B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:

(1) Contract Drawings.

(2) Specifications.

(3) Addenda.

(4) Change Orders and other modifications to the Contract.

(5) Reviewed shop drawings, product data, and samples.

(6) Field test records.

(7) Inspection certificates.

(8) Manufacturer's certificates.

B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.

C. Contractor shall record information concurrent with construction progress.

D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:

(1) Manufacturer's name and product model and number.

(2) Product substitutions or alternates utilized.

(3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.

B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.

C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.

C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.

D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.

E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.

F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing

installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.

B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.

B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.

B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 21 00
ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work.

1.2 RELATED SECTIONS

A. Document 01 10 00 (Summary of Work)

B. Document 01 29 00 (Payments and Completion)

C. Document 01 32 19 (Submittal Procedures)

1.3 ALLOWANCES

A. Included in the Contract, a 10 percent District controlled allowance for Unforeseen Conditions within the limits set forth in the Contract Documents. **This Allowance shall not be utilized without written approval by the District**.

B. Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.

C. Funds will be drawn from Allowance only with District approval evidenced by an Allowance Expenditure Directive.

D. At Contract closeout, funds remaining in Allowance will be credited to District by Change Order.

E. Whenever costs are more than the Allowance, the amount covered by the Allowance will be approved at cost. The Contract Price shall be adjusted by Change Order for amounts in excess of the Allowance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF DOCUMENT

DOCUMENT 01 22 00
ALTERNATES AND UNIT PRICING

PART 4 – ALTERNATES

4.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions;

C. Bid Form and Proposal;

D. Instruction to Bidders.

4.02 DESCRIPTION

The items of work indicated below propose modifications to, substitutions for, additions to and/or deletions from the various parts of the Work specified in other Sections of the Specifications. The acceptance or rejection of any of the alternates is strictly at the option of the District subject to District's acceptance of Contractor's stated prices contained in this Proposal.

4.03 GENERAL

Where an item is omitted, or scope of Work is decreased, all Work pertaining to the item whether specifically stated or not, shall be omitted and where an item is added or modified or where scope of Work is increased, all Work pertaining to that required to render same ready for use on the Project in accordance with intention of Drawings and Specifications shall be included in an agreed upon price amount.

4.04 BASE BID

The Base Bid includes all work required to construct the Project completely and in accordance with the Contract Documents.

4.05 ALTERNATES

A. _____

B. _____

The above Alternate descriptions are general in nature and for reference purposes only. The Contract Documents, including, without limitation, the Drawings and Specifications, must be referred to for the complete scope of Work.

PART 5 - UNIT PRICING

5.01 GENERAL

Contractor shall completely state all required figures based on Unit Prices listed below. Where scope of Work is decreased, all Work pertaining to the item, whether specifically stated or not, shall be omitted and where scope of Work is increased, all work pertaining to that item required to render same ready for use on the Project in accordance with intention of Drawings and Specifications shall be included in an agreed upon price amount.

5.02 UNIT PRICES

Furnish unit prices for each of the named items on a square foot, lineal foot, or per each basis, as applies. Unit prices shall include all labor, materials, services, profit, overhead, insurance, bonds, taxes, and all other incidental costs of Contractor, subcontractors, and supplier(s).

A. _____

B. _____

END OF DOCUMENT

DOCUMENT 01 25 13
PRODUCT OPTIONS AND SUBSTITUTIONS

PART 6 - GENERAL

6.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. Instructions to Bidders;

B. General Conditions, including, without limitation, Substitutions For Specified Items; and

C. Special Conditions.

6.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.

B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.

C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.

D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:

(1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

(2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s)

containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.

E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.

F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.

G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.

H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.

I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 7 – PRODUCTS Not Used.

PART 8 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

APPLICATION FOR PAYMENT AND CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS

CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.

CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(Civil Code Section 8132)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: $_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

(1) Retentions.

(2) Extras for which the claimant has not received payment.

(3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): $_____

(4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(Civil Code Section 8134)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: $_____

Exceptions

This document does not affect any of the following:

1. Retentions.

(5) Extras for which the claimant has not received payment.

(6) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT
(Civil Code Section 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: $_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: $_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT
(Civil Code Section 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: $_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

DOCUMENT 01 31 19
PROJECT MEETINGS

PART 9 – GENERAL

9.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions; and

B. Special Conditions.

9.02 PROGRESS MEETINGS:

A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.

B. Location: Contractor's field office.

C. The Contractor shall notify and invite the following entities ("Invitees"):

(1) District Representative.

(2) Contractor.

(3) Contractor's Project Manager.

(4) Contractor's Superintendent.

(5) Subcontractors, as appropriate to the agenda of the meeting.

(6) Suppliers, as appropriate to the agenda of the meeting.

(7) Construction Manager, if any.

(8) Architect

(9) Engineer(s), if any and as appropriate to the agenda of the meeting.

(10) Others, as appropriate to the agenda of the meeting.

D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.

E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes, those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

9.03 PRE-INSTALLATION/PERFORMANCE MEETING:

A. Contractor shall schedule a meeting prior to the start of each of the following portions of the Work: cutting and patching of plaster and roofing, and other weather-exposed and moisture-resistant products. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the cutting and patching work.

B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.

C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.

D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 10 - PRODUCTS Not Used.

PART 11 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 32 13
SCHEDULING OF WORK

PART 12 – GENERAL

12.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions;

C. Summary of Work; and

D. Submittals.

12.02 SECTION INCLUDES

A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.

(1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").

(2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.

(3) Submit schedules and reports as specified in the General Conditions.

B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

12.03 CONSTRUCTION SCHEDULE

A. Within ten (10) days of issuance of the Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.

B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION	REQUIRED COMPLETION

CONSTRUCTION STARTS **[DATE]**
FINAL PROJECT COMPLETION **[DATE]**

12.04 QUALIFICATIONS

A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.

(1) The written statement shall identify the individual who will perform CPM scheduling.

(2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.

(3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three-fourths (¾) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.

B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

12.05 GENERAL

A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.

B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.

(1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.

(2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

(3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.

C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.

(1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.

(2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.

D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.

E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.

F. Software: Use **[i.e., District Project Planner for Windows, latest version]**. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.

G. Transmit each item under the form approved by District.

(1) Identify Project with District Contract number and name of Contractor.

(2) Provide space for Contractor's approval stamp and District's review stamps.

(3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

12.06 INITIAL CPM SCHEDULE

A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.

C. Initial CPM Schedule shall be time scaled.

D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.

E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.

(1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).

(2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.

F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

12.07 ORIGINAL CPM SCHEDULE

A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.

B. Progress Schedule shall include or comply with following requirements:

(1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.

(2) No activity on schedule shall have duration longer than fifteen (15) Work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.

(a) Activity durations shall be total number of actual Work days required to perform that activity.

(3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

(4) District furnished materials and equipment, if any, identified as separate activities.

(5) Activities for maintaining Project Record Documents.

(6) Dependencies (or relationships) between activities.

(7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.

(a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.

(b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.

(8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.

(a) Include time for fabrication and delivery of manufactured products for the Work.

(b) Show dependencies between procurement and construction.

(9) Activity description: what Work is to be accomplished and where.

(10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.

(11) Resources required (labor and major equipment) to perform each activity.

(12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.

(13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five percent (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to ten (10) days.

(14) Twenty (20) workdays for developing punch list(s), completion of punch list items, and final clean-up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.

(15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

(16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.

(a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.

(b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.

(c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.

(d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.

(17) Activity durations shall be in Work days.

(18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.

C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.

(1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.

(2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:

(a) Clarifications of Contract Requirements.

(b) Directions to include activities and information missing from submittal.

(c) Requests to Contractor to clarify its schedule.

(3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

12.08 ADJUSTMENTS TO CPM SCHEDULE

A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.

(1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:

(a) Accept schedule and cost and resource loaded activities as submitted, or

(b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.

(2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.

(3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.

(4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.

B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.

(1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.

(2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.

(3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.

D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

12.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.

(1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.

(2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as-built" information by indicating when activities were actually started and completed.

B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.

(1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.

(2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.

(3) Contractor shall plan on the meeting taking no less than four (4) hours.

C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.

D. Within five (5) working days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.

(1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

(2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.

E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's

review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

12.10 SCHEDULE REVISIONS

A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.

B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.

C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.

D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.

E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

12.11 RECOVERY SCHEDULE

A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.

C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.

D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

12.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.

B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.

C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.

D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

12.13 TIME EXTENSIONS

A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.

B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14) calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.

D. No time will be granted under this Contract for cumulative effect of changes.

E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.

F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.

G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

12.14 SCHEDULE REPORTS

A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.

B. Required Reports:

(1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.

(2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.

(3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.

(4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.

(5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.

C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

(1) Activities by early start.

(2) Activities by late start.

(3) Activities grouped by Subcontractors or selected trades.

(4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.

D. Furnish District with report files on compact disks containing all schedule files for each report generated.

12.15 PROJECT STATUS REPORTING

A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.

B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:

(1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.

(2) Progress made on critical activities indicated on CPM Schedule.

(3) Explanations for any lack of work on critical path activities planned to be performed during last month.

(4) Explanations for any schedule changes, including changes to logic or to activity durations.

(5) List of critical activities scheduled to be performed next month.

(6) Status of major material and equipment procurement.

(7) Any delays encountered during reporting period.

(8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.

(a) Actual resource shall be accumulated in field by Contractor and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.

(b) Contractor shall explain all variances and mitigation measures.

(9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.

(10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

12.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

12.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

A. Project name and Project number.

B. Contractor's name and address.

C. Weather, temperature, and any unusual site conditions.

D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.

E. Worker quantities for its own Work force and for Subcontractors of any tier.

F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

12.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 13 – PRODUCTS Not Used.

PART 14 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 33 00
SUBMITTALS

PART 15 - GENERAL

15.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;

B. Special Conditions.

15.02 SECTION INCLUDES:

A. Definitions:

(1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.

(2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.

(3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.

B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:

(1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

(2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.

(3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.

(4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.

(5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.

(6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.

(7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.

(8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.

(9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

(1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project

Construction Schedule and the Project Submittal Schedule after each is approved by the District.

(2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.

(3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.

(4) Contractor may be assessed $100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

15.03 SHOP DRAWINGS:

A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.

B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.

C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.

D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.

E. District shall not review Shop Drawings for quantities of materials or number of items supplied.

F. District's and/or Architect’s review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District’s and/or Architect’s review of Shop Drawings is not to be construed as approving departures from Contract Documents.

G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and

regulations of commissions, boards, or other authorities or utilities having jurisdiction.

H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

I. Submitted drawings and details must bear stamp of approval of Contractor:

(1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.

(2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.

J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.

K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.

L. Shop Drawings must clearly delineate the following information:

(1) Project name and address.

(2) Specification number and description.

(3) Architect's name and project number.

(4) Shop Drawing title, number, date, and scale.

(5) Names of Contractor, Subcontractor(s) and fabricator.

(6) Working and erection dimensions.

(7) Arrangements and sectional views.

(8) Necessary details, including complete information for making connections with other Work.

(9) Kinds of materials and finishes.

(10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.

(1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.

(2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

15.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contract must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.

B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.

C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.

D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.

E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

15.05 SAMPLES:

A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.

B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

(1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.

(2) Samples must show full range of texture, color, and pattern.

C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.

D. Samples to be shipped prepaid or hand-delivered to the District.

E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.

F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.

G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.

H. After a material has been approved, no change in brand or make will be permitted.

I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.

J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.

K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:

(1) Size: As Specified.

(2) Furnish catalog numbers and similar data, as requested.

15.06 REVIEW AND RESUBMISSION REQUIREMENTS:

A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.

B. One (1) copy of product or materials data will be returned to Contractor with the review status.

C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.

D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.

E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect’s notes and comments.

F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.

G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.

H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.

I. District's and/or Architect’s review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 16 – PRODUCTS Not Used.

PART 17 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 35 13.23
SITE STANDARDS

PART 18 – GENERAL

18.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;

B. Special Conditions;

C. Drug-Free Workplace Certification;

D. Tobacco-Free Environment Certification;

E. Criminal Background Investigation/Fingerprinting Certification;

F. Temporary Facilities and Controls.

18.02 REQUIREMENTS OF THE DISTRICT:

A. Drug-Free Schools and Safety Requirements:

(1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.

(2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.

(3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.

B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

(1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.

(2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.

(3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

(1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.

(2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.

(3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.

(4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 19 - PRODUCTS Not Used.

PART 20 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 41 00
REGULATORY REQUIREMENTS

PART 21 - GENERAL

21.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;

B. Special Conditions; and

C. Quality Control.

21.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

21.03 REQUIREMENTS OF REGULATORY AGENCIES:

A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").

(1) California Building Standards Administrative Code, Part 1, Title 24, CCR.

(2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).

(3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).

(4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).

(5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

(6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).

(7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.

(8) California Referenced Standards Code, Part 12, Title 24, CCR.

(9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.

(10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:

(a) NFPA 13 - Automatic Sprinkler System.

(b) NFPA 14 - Standpipes Systems.

(c) NFPA 17A - Wet Chemical System

(d) NFPA 24 - Private Fire Mains.

(e) (California Amended) NFPA 72 - National Fire Alarm Codes.

(f) NFPA 253 - Critical Radiant Flux of Floor Covering System.

(g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.

(11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:

(a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.

(b) DSA IR A-7 — Project Inspector Certification and Approval.

(c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.

(d) DSA IR A-12 — Assistant Inspector Approval.

(12) DSA Procedures ("DSA PR")

(a) DSA PR 13-01 – Construction Oversight Process

(b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

(1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.

(2) Special inspections per Section 4-333(c).

(3) Deferred Approvals per section 4-317(g).

(4) Verified reports per Sections 4-336 & 4-343(c).

(5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.

(6) Duties of the Contractor shall be per Section 4-343.

(7) Duties of Project Inspector shall be per Section 4-334.

(8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

(1) Contractor shall submit the following to Architect for review and endorsement:

(a) Product information on proposed material/system supplier.

(b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.

(c) All other requirements as may be required by DSA.

(2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.

(3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.

(4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 22 – PRODUCTS Not Used.

PART 23 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 42 13
ABBREVIATIONS AND ACRONYMS

PART 24 – GENERAL

24.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions including without limitation, Definitions;

B. Special Conditions.

24.02 DOCUMENT INCLUDES:

A. Abbreviations used throughout the Contract Documents.

B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association
27.	CCR	California Code of Regulations

28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 25 - PRODUCTS Not Used.

PART 26 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 42 16
DEFINITIONS

PART 27 - GENERAL

27.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions including without limitation, Definitions;

B. Special Conditions.

27.02 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.

B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.

C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.

D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.

E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.

F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.

G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

DOCUMENT 01 42 19
REFERENCES

PART 28 - GENERAL

28.01 SCHEDULE OF REFERENCES:

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930

PART 29 - PRODUCTS Not Used.

PART 30 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 43 00
MATERIALS AND EQUIPMENT

PART 31 - GENERAL

31.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Purchase of Materials and Equipment;

B. Special Conditions;

C. Imported Materials Certification.

31.02 MATERIAL AND EQUIPMENT

A. Only items approved by the District and/or Design Professional shall be used.

B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

31.03 MATERIAL AND EQUIPMENT COLORS

A. The District and/or Architect will provide a schedule of colors.

B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

31.04 DELIVERY, STORAGE, AND HANDLING

A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.

B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.

C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.

E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.

F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.

G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 32 - PRODUCTS

32.01 MANUFACTURERS

A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.

B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

32.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

32.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to “standard specifications” and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 33 - EXECUTION

33.01 WORKMANSHIP

A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).

B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

33.02 COORDINATION

A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.

B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

33.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. For example, electric water coolers require water, electricity, and drain services; roof drains require drain system; sinks fit within countertop, etc. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

33.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

33.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative. Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

DOCUMENT 01 45 00
QUALITY CONTROL

PART 34 - GENERAL

34.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;

B. Special Conditions.

34.02 RELATED CODES:

A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.

B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

34.03 OBSERVATION AND SUPERVISION:

A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.

B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:

(1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.

(2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

(3) The Project Inspector shall observe and monitor all testing and inspection activities required.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343. The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

34.04 TESTING AGENCIES:

A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.

B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."

C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.

34.05 TESTS AND INSPECTIONS:

A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.

B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.

C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:

(1) Tests and observations for earthwork and paving.

(2) Tests for concrete mix designs, including tests of trial batches.

(3) Tests and inspections for structural steel work.

(4) Field tests for framing lumber moisture content.

(5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.

(6) Tests and observations of welding and expansion anchors.

D. The District may at its discretion, pay and then back charge the Contractor for:

(1) Re-tests or re-inspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.

(2) Uncovering of work in accordance with Contract Documents.

(3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.

(4) Testing done off Site.

E. Testing and inspection reports and certifications:

(1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.

(a) The District;

(b) The Construction Manager, if any;

(c) The Architect;

(d) The Consulting Engineer, if any;

(e) Other engineers on the Project, as appropriate;

(f) The Project Inspector; and

(g) The Contractor.

(2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

PART 35 - PRODUCTS

35.01 TYPE OF TESTS AND INSPECTIONS

A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)

B. Slump Test
ASTM C 143

C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

(1) Compressive Strength:

(a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

(b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.

(c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.

(d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.

(e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

E. Structural Steel Per Title 24 and as noted:

(1) Material: Steel per Table in Title 24, Section 2712.

(2) Qualification of Welders (UBC Std. 27-6).

(3) Shop fabrication (Section 2712(d). Structural steel only).

(4) Shop and field welding (Section 2712(e)).

PART 36 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 37 – GENERAL

37.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions;

C. Site Standards; and

D. Construction Waste Management and Disposal.

37.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

(1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.

(2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.

(3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.

(4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Heat and Ventilation:

(1) Contractor shall provide temporary heat to maintain environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation and curing of materials, and to protect materials and finishes from damage due to improper temperature and humidity conditions. Portable heaters shall be standard units complete with controls.

(2) Contractor shall provide forced ventilation and dehumidification, as required, of enclosed areas for proper installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, and gases.

(3) Contractor shall pay the costs of installation, maintenance, operation, and removal of temporary heat and ventilation, including costs for fuel consumed, required for the performance of the Work.

C. Water:

(1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

(2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.

(3) Contractor shall make potable water available for human consumption.

D. Sanitary Facilities:

(1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.

(2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

E. Telephone Service:

(1) Contractor shall arrange with local telephone service company for telephone service as required for the performance of the Work. Contractor shall, at a minimum, provide in its field office one line for telephone and one line for fax machine.

(2) Contractor shall pay the costs for telephone and fax lines installation, maintenance, service, and removal.

F. Fire Protection:

(1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.

(2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

G. Trash Removal:

(1) Contractor shall provide trash removal on a timely basis**.** Under no circumstance shall Contractor use District trash service.

H. Field Office:

(1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work. Contractor may use the corridor adjacent to the construction area for an office area, if approved in writing by District.

(2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

I. Temporary Facilities:

(1)

37.03 CONSTRUCTION AIDS:

A. Plant and Equipment:

(1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.

(2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.

B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

37.04 BARRIERS AND ENCLOSURES:

A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.

B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.

C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.

D. Tree and Plant Protection:

(1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.

(2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.

(3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

(4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.

(5) Excavation around Trees:

(a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.

(b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and

taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.

(c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.

(d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.

(e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.

(f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

37.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

37.06 TEMPORARY CONTROLS:

A. Noise Control:

(1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.

(2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

(1) Equipment and impact tools shall have intake and exhaust mufflers.

(2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

(1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.

(2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.

(3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.

(4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

(1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

(1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.

(2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

(1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

37.07 JOB SIGN(S):

A. General:

(1) Contractor shall provide and maintain a Project identification sign with the design, text, and colors designated by the District and/or the Design Professional; locate sign as approved by the District.

(2) Signs other than the specified Project sign and or signs required by law, for safety, or for egress, shall not be permitted, unless otherwise approved in advance by the District.

B. Materials:

(1) Structure and Framing: Structurally sound, new or used wood or metal; wood shall be nominal 3/4-inch exterior grade plywood.

(2) Sign Surface: Minimum 3/4-inch exterior grade plywood.

(3) Rough Hardware: Galvanized.

(4) Paint: Exterior quality, of type and colors selected by the District and/or the Design Professional.

C. Fabrication:

(1) Contractor shall fabricate to provide smooth, even surface for painting.

(2) Size: 4'-0" x 8'-0", unless otherwise indicated.

(3) Contractor shall paint exposed surfaces of supports, framing, and surface material with exterior grade paint: one coat of primer and one coat of finish paint.

(4) Text and Graphics: As indicated.

37.08 PUBLICITY RELEASES:

A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 38 – PRODUCTS Not used.

PART 39 – EXECUTION Not used.

END OF DOCUMENT

DOCUMENT 01 50 13
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 40 - GENERAL

40.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions; and

C. Temporary Facilities and Controls.

40.02 SECTION INCLUDES:

A. Administrative and procedural requirements for the following:

(1) Salvaging non-hazardous construction waste.

(2) Recycling non-hazardous construction waste.

(3) Disposing of non-hazardous construction waste.

40.03 DEFINITIONS:

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

40.04 PERFORMANCE REQUIREMENTS:

A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

40.05 SUBMITTALS:

A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.

B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:

(1) Material category.

(2) Generation point of waste.

(3) Total quantity of waste in tons or cubic yards.

(4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.

(5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.

(6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.

(7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

H. CHPS Submittal: CHPS letter template for Credit ME2.0 and ME2.1, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

I. Qualification Data: For Waste Management Coordinator.

J. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

K. Submittal procedures and quantities are specified in Document 01 33 00.

40.06 QUALITY ASSURANCE:

A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:

(1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.

(2) Review requirements for documenting quantities of each type of waste and its disposition.

(3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.

(4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

(5) Review waste management requirements for each trade.

40.07 WASTE MANAGEMENT PLAN:

A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

(1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

(2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.

(3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

(4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

(5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

(6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 41 - PRODUCTS Not Used.

PART 42 - EXECUTION

42.01 PLAN IMPLEMENTATION:

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

(1) Comply with Document 01 50 00 for operation, termination, and removal requirements.

B. **[**Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.**]**

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

(1) Distribute waste management plan to everyone concerned within 3 days of submittal return.

(2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

(1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

(2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

42.02 RECYCLING CONSTRUCTION WASTE:

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

(1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.

(a) Inspect containers and bins for contamination and remove contaminated materials if found.

(2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

(3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.

(4) Store components off the ground and protect from the weather.

(5) Remove recyclable waste off District property and transport to recycling receiver or processor.

D. Packaging:

(1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.

(2) Polystyrene Packaging: Separate and bag material.

(3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.

(4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

E. Site-Clearing Wastes: Chip brush, branches, and trees on site.

F. Wood Materials:

(1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.

(2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

G. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

(1) Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

42.03 DISPOSAL OF WASTE:

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

(1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.

(2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

DOCUMENT 01 52 13
FIELD OFFICES

PART 43 – GENERAL

43.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions; and

C. Temporary Facilities and Controls.

43.02 SECTION INCLUDES:

A. Requirements for Field Offices and Field Office Trailers.

43.03 SUMMARY:

A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.

B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.

C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.

D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.

E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

43.04 SUBMITTALS:

A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.

B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.

D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.

E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.

F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

43.05 QUALITY ASSURANCE

A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.

B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.

C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.

D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.

E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

43.06 REGULATORY REQUIREMENTS

A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.

B. California Building Standards Code ("CBSC").

C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").

D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 44 – PRODUCTS

44.01 FIELD OFFICE TRAILER

A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.

B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.

C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.

(1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.

(2) Stairs, Platform: Properly finished stairs, platforms, and ramps.

(3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.

(4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged or both, as directed by District.

(5) HVAC:

(6) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.

(7) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

(8) Telephones and Telephone Outlets: Two (2) telephone lines wired, connected to telephone utility service, and ready for use, and two (2) telephone instruments, each with two (2)-line capability, speed dial and hands-free feature. Locate each outlet as directed by District.

(9) Voicemail Messaging System or Answering Machine: One (1) unit, two (2)-line; digital.

44.02 FIELD OFFICE TRAILER ITEMS

A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:

(1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

(2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.

(3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.

(4) Waste Baskets: Two (2) waste baskets, one at each desk.

B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.

(1) File cabinet: One (1); four (4) drawer; lateral; steel locking.

(2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.

(3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.

(4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.

(5) Plan Rack: One (1) wheel mounted plan rack.

(6) Waste Baskets: One (1) large waste basket.

(7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.

(8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:

(a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.

(b) Network: Ethernet or Token Ring network ready, Plug-and-Play.

(c) Print, send/receive facsimile from any connected workstation.

(d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.

(e) Print Speed: Twenty (20) pages per minute, minimum.

(f) Copies: Twenty (20) copies per minute, minimum.

(g) Document Handler: Forty (40) sheet, minimum

(h) Collator: Forty (40) bin, minimum, with stapling.

(i) Duplexing: Capable.

(j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.

(k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.

(l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).

(m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.

(n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.

(o) Halftone: Sixty-four (64) levels.

(p) Redial: Automatic and Manual.

(9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:

(a) Unlimited Service Calls.

(b) Same Day Response.

(c) All parts, labor, preventative maintenance and mileage.

(d) All chemicals, such as toner, fixing agent, and the like.

(e) System training and setup.

(10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.

(a) Location: As directed by District.

(b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean, and sanitize each unit each day at a location and time as directed by District.

(c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

44.03 UTILITY AND SERVICES

A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.

B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

44.04 FINISHES

A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.

B. Finish: Color as selected by District from manufacturer standard palette.

PART 45 – EXECUTION

45.01 INSTALLATION

A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and

the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.

B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.

C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.

E. Location: As directed by District.

F. Fire Resistance: Construct and install in accordance with UL requirements.

G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.

H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.

(1) Frequency: Two (2) times per week, minimum.

I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

DOCUMENT 01 64 00
OWNER-FURNISHED PRODUCTS

PART 46 – GENERAL

46.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions; and

C. Materials and Equipment.

46.02 SECTION INCLUDES

A. Requirements for the following:

(1) Installing Owner-furnished materials and equipment.

(2) Providing necessary utilities, connections and rough-ins.

46.03 DEFINITIONS

A. Owner: District, who is providing/furnishing materials and equipment.

B. Installing Contactor: Contractor, who is installing the materials and equipment furnished by the Owner.

46.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Receive, store and handle products in accordance with the manufacturer's instructions.

B. Protect equipment items as required to prevent damage during storage and construction.

PART 47 – PRODUCTS

47.01 GENERAL PRODUCT REQUIREMENTS

A. Installing Contractor's Responsibilities:

(1) Verify mounting and utility requirements for Owner-furnished materials and equipment items.

(2) Provide mounting and utility rough in for all items where required.

(a) Rough in locations, sizes, capacities, and similar type items shall be as indicated and required by product manufacturer.

B. Owner and Installing Contractor(s) Responsibilities:

(1) Owner-Furnished/Contractor Installed ("OFCI"): Furnished by the Owner; installed by the Installing Contractor.

(a) General: Owner and Installing Contractor(s) will coordinate deliveries of materials and equipment to coincide with the construction schedule.

(b) Owner will furnish specified materials and equipment delivered to the site. Owner/vendor's representative shall be present on Site at the time of delivery to comply with the contract requirements and Specifications Section 01 43 00, Materials and Equipment, Article 1.04.

(c) The Owner furnishing specified materials and equipment is responsible to provide manufacturer guarantees as required by the Contract to the Installing Contractor.

(d) The Installing Contractor shall:

1) Review, verify and accept the approved manufacturer's submittal/Shop Drawings for all materials and equipment required to be installed by the Installer Contractor and furnished by the Owner. Any discrepancies, including but not limited to possible space conflicts, should be brought to the attention of the Project Manager and/or Program Manager, if applicable.

2) Coordinate timely delivery. Installing Contractor shall receive materials and equipment at Site when delivered and give written receipt at time of delivery, noting visible defects or omissions; if such declaration is not given, the Installing Contractor shall assume responsibility for such defects and omissions.

3) Store materials and equipment until ready for installation and protect from loss and damage. Installing Contractor is responsible for providing adequate storage space.

4) Coordinate with other bid package contractors and field measurement to ensure complete installation.

5) Uncrate, assemble, and set in place.

6) Provide adequate supports.

7) Install materials and equipment in accordance with manufacturer's recommendations, instructions, and Shop Drawings, supply labor and material required, and

make mechanical, plumbing, and electrical connections required to operate equipment.

8) Be certified by equipment manufacturer for installation of the specific equipment supplied by the Owner.

9) Provide anchorage and/or bracing as required for seismic restraint per Title 24, UBC Standard 27-11 and all other applicable codes.

10) Provide the contract-required warranty and guarantee for all work, materials and equipment, and installation upon its completion and acceptance by the District. Guarantee includes all costs associated with the removal, shipping to and from the Site, and re-installation of any equipment found to be defective.

C. Compatibility with Space and Service Requirements:

(1) Equipment items shall be compatible with space limitations indicated and as shown on the Contract Documents and specified in other sections of the Specifications.

(2) Modifications to equipment items required to conform to space limitations specified for rough in shall not cause additional cost to the District.

D. Manufacturer's printed descriptions, specifications, and instructions shall govern the Work unless specifically indicated or specified otherwise.

47.02 FURNISHED MATERIALS AND EQUIPMENT

A. All furnished materials and equipment are indicated or scheduled on the Contract Documents.

PART 48 – EXECUTION

48.01 INSTALLATION

A. Install equipment items in accordance with the manufacturer's instructions.

B. Set equipment items securely in place, rigidly or flexibly mounted in accordance with manufacturers' directions.

C. Make electrical and mechanical connections as indicated and required.

D. Touch-up and restore damaged or defaced finishes to the Owner's satisfaction.

48.02 CLEANING AND PROTECTION

A. Repair or replace items not acceptable to the Architect or Owner.

B. Upon completion of installation, clean equipment items in accordance with manufacturer's recommendations, and protect from damage until final acceptance of the Work by the Owner.

END OF DOCUMENT

SECTION 01 66 00
PRODUCT DELIVERY, STORAGE AND HANDLING

PART 49 - GENERAL

49.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;

B. Special Conditions.

49.02 PRODUCTS

A. Products are as defined in the General Conditions.

B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.

C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

49.03 TRANSPORTATION AND HANDLING

A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.

B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.

C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

49.04 STORAGE AND PROTECTION

A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.

B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.

C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.

E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.

F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 50 – PRODUCTS Not Used.

PART 51 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 71 23
FIELD ENGINEERING

PART 52 - GENERAL

52.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;

B. Special Conditions;

C. Site-Visit Certification.

52.02 REQUIREMENTS INCLUDED:

A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:

(1) Survey work required in execution of the Project.

(2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

52.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

52.04 SURVEY REFERENCE POINTS:

A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.

B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:

(1) Make no changes or relocation without prior written notice to District and Architect.

(2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

(3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

52.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

52.06 SUBMITTALS:

A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.

B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.

C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 53 – PRODUCTS Not Used.

PART 54 - EXECUTION

54.01 COMPLIANCE WITH LAWS:

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

54.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

DOCUMENT 01 73 29
CUTTING AND PATCHING

PART 55 – GENERAL

55.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;

B. Special Conditions;

C. Hazardous Materials Procedures and Requirements;

D. Hazardous Materials Certification;

E. Lead-Based Paint Certification;

F. Imported Materials Certification.

55.02 CUTTING AND PATCHING:

A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:

(1) Make several parts fit together properly.

(2) Uncover portions of Work to provide for installation of ill-timed Work.

(3) Remove and replace defective Work.

(4) Remove and replace Work not conforming to requirements of Contract Documents.

(5) Remove Samples of installed Work as specified for testing.

(6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

(7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.

B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.

C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

55.03 SUBMITTALS:

A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:

(1) The work of the District or other trades.

(2) Structural value or integrity of any element of Project.

(3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.

(4) Efficiency, operational life, maintenance or safety of operational elements.

(5) Visual qualities of sight-exposed elements.

B. Contractor's Request shall also include:

(1) Identification of Project.

(2) Description of affected Work.

(3) Necessity for cutting, alteration, or excavations.

(4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.

(5) Description of proposed Work:

(a) Scope of cutting, patching, alteration, or excavation.

(b) Trades that will execute Work.

(c) Products proposed to be used.

(d) Extent of refinishing to be done.

(6) Alternates to cutting and patching.

(7) Cost proposal, when applicable.

(8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.

(9) Written permission of District or other District contractor(s) whose work will be affected.

55.04 QUALITY ASSURANCE:

A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.

B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

55.05 PAYMENT FOR COSTS:

A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.

B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 56 - PRODUCTS

56.01 MATERIALS:

A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.

B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 57 – EXECUTION

57.01 INSPECTION:

A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching,

excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

57.02 PREPARATION:

A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.

B. Contractor shall provide devices and methods to protect other portions of Project from damage.

C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

57.03 ERECTION, INSTALLATION AND APPLICATION:

A. With respect to performance, Contractor shall:

(1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.

(2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.

(3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.

B. Contractor shall employ original installer or fabricator to perform cutting and patching for:

(1) Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants, waterproofing, and other trades.

(2) Sight-exposed finished surfaces.

C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.

D. Contractor shall fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever

calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.

E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

DOCUMENT 01 76 00
ALTERATION PROJECT PROCEDURES

PART 58 – GENERAL

58.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;

B. Special Conditions.

PART 59 - PRODUCTS

59.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.

B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 60 - EXECUTION

60.01 EXAMINATION:

A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.

B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

60.02 PREPARATION:

A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.

B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.

D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

E. Contractor shall close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity. Contractor shall insulate ductwork and piping to prevent condensation in exposed areas. Contractor shall insulate building cavities for thermal and/or acoustical protection, as detailed.

60.03 INSTALLATION:

A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.

B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, mechanical work and electrical work.

C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.

D. Contractor shall refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat and square or straight transition to adjacent finishes.

E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

60.04 TRANSITIONS:

A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.

B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

60.05 ADJUSTMENTS:

A. Where removal of partitions or walls results in adjacent spaces becoming one, Contractor shall rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

B. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.

C. Contractor shall trim and seal existing wood doors and shall trim and paint metal doors as necessary to clear new floor finish and refinish trim as required.

D. Contractor shall fit Work at penetrations of surfaces.

60.06 REPAIR OF DAMAGED SURFACES:

A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.

B. Contractor shall repair substrate prior to patching finish.

60.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.

B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.

C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

60.08 FINISHES:

A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.

B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

60.09 CLEANING:

A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

DOCUMENT 01 77 00

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 61 - GENERAL

61.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Completion of Work;

B. Special Conditions;

C. Temporary Facilities and Controls.

61.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

61.03 FINAL CLEANING

A. Contractor shall execute final cleaning prior to final inspection.

B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.

C. Contractor shall clean equipment and fixtures to a sanitary condition.

D. Contractor shall replace filters of operating equipment.

E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.

F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.

G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

61.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

61.05 RECORD DOCUMENTS AND SHOP DRAWINGS

A. Contractor shall legibly mark each item to record actual construction, including:

(1) Measured depths of foundation in relation to finish floor datum.

(2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.

(3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.

(4) Field changes of dimension and detail.

(5) Details not on original Contract Drawings

(6) Changes made by modification(s).

(7) References to related Shop Drawings and modifications.

B. Contractor will provide one set of Record Drawings to District.

C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

61.06 INSTRUCTION OF DISTRICT PERSONNEL

A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.

C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.

E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

61.07 SPARE PARTS AND MAINTENANCE MATERIALS

A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

SECTION 02 30 00 SUBSURFACE INVESTIGATION

PART 1 GENERAL

1.1 DESCRIPTION

A. Section includes:

B. This section describes the subsurface conditions observed during the Geotechnical Investigation for this project. The Geotechnical Report is available for review upon written request from the Architect for the cost of printing.

C. Related Work:
1. Section 31 00 00: Earthwork
2. Geotechnical Investigation Report: See attachments

1.2 QUALITY ASSURANCE

A. Prior to bidding, bidders may request their own subsurface investigations to satisfy themselves as to site and subsurface conditions. Any such investigations shall be performed only under time schedules and arrangements approved in advance by the Architect.

1.3 OBSERVED SUBSURFACE CONDITIONS

A. Subsurface Conditions:
1. See the Geotechnical Investigation Report as described in Section 31 00 00: Earthwork

B. Actual Conditions:
1. The subsurface information provided is based on soil borings and observations made during the Geotechnical Investigation and are not a guarantee of actual subsurface conditions. If any variations or undesirable conditions are encountered during construction, the contractor shall notify the Geotechnical Engineer and the Architect so that supplementary direction can be given.
   a. Review when applicable with DSA IR.
2. Existing utilities and facilities shown are based on record drawings and surface observations. The contractor shall verify locations of existing utilities to protect, identify for relocation, or remove, as necessary for the performance of work to complete this project.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 02 30 00

SECTION 02 41 00 DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Furnishing all labor, materials, and equipment necessary for demolition, dismantling, cutting, and alterations as indicated, specified, and required for completion of the Contract, as applicable. Includes items such as the following:
      a. Protecting existing work to remain.
      b. Hazardous material identification and removal.
      c. Utility service and termination.
      d. Removing debris and equipment.
      e. Removal of items indicated on Drawings.
      f. Landscape and sprinkler demolition and reinstall.
      g. Disposal of material.

B. Related Sections:
   1. Section 01 50 00: Temporary Facilities and Controls.
   2. Section 01 57 13: Erosion control.
   3. Section 01 74 19: Construction Waste Management and Disposal.
   4. Section 02 21 00: Surveys.
   5. Section 31 00 00: Earthwork.
   6. Section 33 00 00: Utilities.

C. Regulatory Requirements:
   1. Conform to applicable jurisdictional authority regulations and codes for disposal of debris.
   2. Coordinate clearing work with utility companies.
   3. Maintain emergency access ways at all times.
   4. Contractor shall comply with all applicable laws and ordinances regarding hazardous materials, including contaminated soils, hazardous material transformers, and similar materials or components.

1.3 SUBMITTALS:

A. Schedule: Submit a detailed sequence of demolition and removal work, including dates for shutoff, capping, and continuance of utility services.

B. Procedures: Submit written procedures documenting the proposed methods to be used to control dust and noise.

1.4 EXISTING CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

B. Conduct demolition to minimize interference with adjacent structures or items to remain. Maintain protected egress and access at all times.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during Work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

B. Conduct demolition to minimize interference with adjacent structures or items to remain. Maintain protected egress and access at all times.

3.2 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, Contractor shall be solely and completely responsible for working conditions at the jobsite, including safety of all persons and property during performance of the Work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Safety precautions prevent damage to existing elements identified to remain or to be salvaged and prevent injury to the public and workmen engaged onsite. Demolish roofs, walls, and other building elements in such a manner that demolished materials fall within foundation lines of building. Do not allow demolition debris to accumulate onsite. Pull down hazardous work at end of each day; do not leave standing or hanging overnight, or over weekends:
   1. Protect existing items that are not indicated to be altered. Protect utilities designated to remain from damage.
   2. Protect trees, plant growth, and features designated to remain as final landscaping as shown on Drawings.
   3. Protect bench marks from damage or displacement.

D. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

E. Fire Safety: Contractor shall conform to Chapter 33 of the California Fire Code (CFC), "Fire Safety During Construction and Demolition," at all times during the construction process. A copy of this chapter can be provided.

F. Any construction review of Contractor's performance conducted by the geotechnical Engineer is not intended to include review of the adequacy of Contractor's safety measures in, on, or near the construction site.

G. Surface Drainage: Provide for surface drainage during period of construction in a manner to

avoid creating nuisance to adjacent areas. Contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of Work, regardless of cause, source, or nature of water.

H. Adjacent streets and sidewalks shall be kept free of mud, dirt, or similar nuisances resulting from earthwork operations.

I. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

3.3 EXAMINATION

A. Examine conditions of work in place before beginning Work; report defects.

B. Report existence of hazardous materials or unsafe structural conditions.

3.4 PREPARATION

A. Scheduling:
   1. General: Coordinate and schedule demolition work as required by Owner and as necessary to facilitate construction progress.

B. Hazardous Materials:
   1. General: Identify chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations, and notify such jurisdictional agencies as may be required. Collect and legally dispose of such materials at official disposal locations away from the site.
   2. Asbestos: If asbestos or materials containing asbestos are encountered, stop work immediately and contact Owner. Do not proceed with demolition until directed by Owner.

C. Utility and Service Termination:
   1. Locate and identify existing utility, service, and irrigation system components affected by Work of this Contract. Review existing record Drawings, conduct site investigations, contact Underground Service Alert and other qualified cable/pipe/line locator services, and implement all other means necessary to define the location of underground systems.
   2. Prior to beginning any demolition, properly disconnect all water, gas, and electrical power supply at appropriate disconnect locations. Obtain all necessary releases and approvals from serving utility companies.
   3. Prior to demolition or disconnect, obtain Owner’s approval that such system does not impact facilities or systems beyond the extent of this Contract.
   4. Mark location of disconnected systems. Identify and indicate stub-out locations on Project record documents.

D. Verify that existing plant life and features designated to remain are tagged or identified.
   1. Architect will mark the features, trees, and shrubs to remain within the construction area. Contractor shall not commence clearing and grubbing operations until authorized by Owner and all protective measures are in place.

E. Coordinate the time and duration of all system disconnects with Owner.

3.5 DEMOLITION

A. General Requirements:

1. Clear areas required for access to site and execution of Work, including pavement, structures, foundations, vegetation, trash, and debris.
2. Coordinate with Owner the time of day and route to remove demolished materials from premises.
3. Remove demolished materials from site as work progresses. Upon completion of work, leave areas of work in clean condition.
4. Remove all buried debris, rubble, trash, or other material not deemed suitable by the geotechnical Engineer.
5. Fill all voids or excavations resulting from clearing, demolition, or removal of vegetation with specified fill material.

B. Fixture and Equipment Removal:
1. Remove existing fixtures and equipment as identified and shown on Drawings and required by Architect.
2. Verify all service connections to fixtures and equipment designated for removal have been properly disconnected.
3. Remove all conductors from conduit at all abandoned circuits.

3.6 UTILITY AND BUILDING SERVICES REMOVAL AND RE-INSTALLATION

A. Where crossing paths and potential points of interference with existing utility services are shown or can be reasonably inferred from surface conditions or evidence of subsurface systems, such as meter boxes, vaults, relief vents, cleanouts, and similar components:
1. Review all Contract Documents showing crossing paths and potential points of interference.
2. Pot-hole or determine by other means the accurate depth and location of such utilities.
3. Incorporate all costs required to complete work under this Contract, including additional trenching, re-routing of existing and new utilities, and all means necessary to construct work under this Contract.
4. No additional cost to Owner will be allowed for work necessary to accommodate utility conflicts where such crossing paths are shown on Contract Drawings or can be reasonably inferred from surface conditions or components.

B. Remove all conductors from conduit at all abandoned electrical circuits.

C. Seal off ends of all piping, drains, and other components as directed by Architect and serving utility.

D. Where necessary to maintain service to existing utility and building systems, relocate or redirect all conduit and conductors, piping, drains, and associated system components:
1. Re-circuit all electrical as required.
2. Re-circuit all landscape irrigation valving and control systems as required.
3. Temporarily terminate landscape system components in approved boxes or with approved caps, suitable for re-connection or extension.
4. Extend or otherwise modify all site drainage systems, including catch basins, drain inlets, and piping. Fine grade to maintain proper drainage flow pattern to drains.

E. Demolish structure in an orderly and careful manner:
1. Use of explosives prohibited.

3.7 SITE PAVEMENT REMOVAL

A. Remove sidewalk and curb where required for new construction as specified and as indicated on the Drawings:
1. Remove all paving by saw-cutting.

2. Remove concrete paving and curbing at locations shown on Drawings. Locate closest adjacent expansion or weakened plane joint to define start of removal or saw-cutting.

B. Remove asphalt concrete paving areas where required for new construction as specified and as indicated on the Drawings:
   1. Remove all paving by saw-cutting.
   2. Remove paving assembly as required to expose subgrade.

3.8 LANDSCAPE AND IRRIGATION SYSTEMS DEMOLITION AND RENOVATION

A. Clearing, Grubbing, and Planting Demolition:
   1. Remove grass and grass roots to a minimum depth of two inches (2”) below existing grade.
   2. Remove all shrubs, plants, and other vegetation within the area of the work unless designated to remain. Grub and remove all roots of all vegetation to a depth of 24 inches below existing grade.
   3. Remove only those trees that are specifically designated for removal, or as shown on the Drawings, within the construction area. Remove all stumps. Remove root ball and root systems larger than one inch (1”) in diameter to a depth of two feet (2’) below existing or finished grades, whichever is lower, and a minimum of five feet (5’) beyond the edge of paving, structure, wall, or walkway.
   4. Hand cut existing tree roots over one inch (1”) in diameter as necessary for trenching or other new construction. Apply multiple coats of emulsified asphalt sealant especially made for horticultural use on cut or damaged plant tissues to cut faces and adjacent surfaces. Cover exposed roots with wet burlap to prevent roots from dying out until backfilling is complete.
   5. Disking and mixing of vegetation, trash, debris, and other deleterious materials with surface soils prior to grading is not permitted.
   6. Remove all buried debris, organic material, rubble, trash, or other material not deemed suitable by the geotechnical Engineer.
   7. Fill all voids or excavations resulting from clearing, demolition, or removal of vegetation with fill material in compliance with Section 31 00 00: Earthwork.
   8. Selected equipment of such sizes and capacities that the existing environment is disturbed as little as possible, and to afford ease of mobility within limited and relatively confined work areas. Make every effort to preserve the topography in its natural state.
   9. Keep drains, catch basins, surface drainage courses, and related drainage system components clear of debris and construction materials.
   10. Remove irrigation piping and appurtenances as necessary within area of work, unless noted otherwise to remain. Replace irrigation piping and appurtenances to irrigate new and/or existing landscaping. Contractor shall be responsible for temporary landscape irrigation until such time that irrigation system is restored and operational.

3.9 DISPOSAL

A. Demolished materials become property of the Contractor and shall be removed from premises, except those items specifically listed to be retained by Owner.

B. Dispose of all demolished material, trash, debris, and other materials not used in the work in accordance with the regulations of jurisdictional authority.

C. It is required that all materials that are of a recyclable nature, be transported to a suitable legal recycling facility instead of a dump or refuse facility (unless they are one-in-the same).

D. Burning and Burying of Materials: **Not allowed**.

E. Haul Routes:
   1. Obtain permits as required by jurisdictional agencies. Establish haul routes in advance; post flagmen for the safety of the public and workmen.
   2. Keep streets free of mud, rubbish, etc. Assume responsibility for damage resulting from hauling operations; hold Owner free of liability in connection therewith.

F. Remove demolished materials and debris from site on a daily basis.

3.10 CLEANING

A. Upon completion of work of this Section, promptly remove from the working area all scraps and debris.

B. Clean excess material from the surface of all remaining paved surfaces and utility structures.

C. Power wash all concrete surfaces to remove stains, dried mud, tire marks, and rust spots.

END OF SECTION 02 41 00

SECTION 02 41 13 SELECTIVE SITE DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Furnishing all labor, materials, and equipment necessary for demolition, dismantling, cutting, and alterations as indicated, specified, and required for completion of the Project, as applicable. Includes items such as the following:
      a. Protecting existing work to remain.
      b. Cleaning soiled materials that are to remain.
      c. Disconnecting and capping utilities.
      d. Removing debris and equipment.
      e. Removal of items indicated on Drawings.
      f. Salvageable items to be retained by Owner as indicated on Drawings and during the pre-construction job walk.

1.3 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain Owner's property.

B. Remove and Salvage: Items indicated to be removed and salvaged remain Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to location as directed by Owner's representative.

C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse. Store and protect against damage. Reinstall items in locations indicated.

D. Existing to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by Owner's representative, items may be removed to a suitable, protected storage location during demolition and then cleaned and reinstalled in their original locations.

E. Replace: Remove and legally dispose of existing item(s) indicated and install new like item(s) that conform to Project Specifications.

1.4 QUALITY ASSURANCE

A. Comply with the following:
   1. Applicable codes, ordinances, and regulations of local, municipal, state, and federal authorities having jurisdiction.
   2. Comply strictly to Rule XXX Fugitive Dust, XXXX Air Quality Management District.
   3. Obtain necessary permits and notices; post where required.
   4. Comply with safety requirements of the local fire department.
   5. Comply with ANSI A10.6.

B. Notify affected utility companies before starting Work and comply with their requirements.

C. Carefully perform demolition work by skilled workers experienced in building demolition procedures, using appropriate tools and equipment. Perform work, at all times, under the direct supervision of a supervisor approved by Owner's inspector.

D. Coordinate demolition with other trades to ensure correct sequence, limits, and methods of proposed demolition. Schedule work to create least possible inconvenience to the public and to facility operations.

E. Pre-Demolition:
1. Conduct conference at Project site seven (7) days prior to scheduled installation:
   a. Conference agenda shall include review and discussion of requirements of authorities having jurisdiction, instructions and requirements of serving utilities, sequencing and interface considerations, and Project conditions.
   b. Conference shall be attended by supervisory and quality control personnel of Contractor and all subcontractors performing this and directly related work. Submit minutes of meeting to design builder's representative for Project record purposes.

F. Ownership of Materials:
1. Except for items or materials indicated to be reused, salvaged, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from the site with further disposition at Contractor's option.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Items scheduled for salvage by Owner shall be delivered to a location designated by Owner's authorized representative. Items shall be cleaned, packaged, and labeled for storage.

B. Items scheduled for reuse shall be stored onsite and protected from damage, soiling, and theft.

C. Follow legal requirement to hand expose to the point of no conflict 24 inches on either side of the underground facility, so its exact location is known before using power equipment.

D. Note: If caught digging without a Dig Alert ticket, a fine of up to fifty thousand dollars ($50,000.00) may be assessed per California government code 4216.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: The onsite shallow sands encountered in the borings are considered non-expansive and following proper processing should be suitable for backfilling purposes provided they are free of deleterious materials and oversize particles. Import materials may also be used for backfilling. The onsite or imported materials being used for backfilling should be non-expansive (EI less than 20), and should be in compliance with the specifications of the Project's soils report.

B. Backfill and Native Fill Materials: The onsite soils may be reused as compacted engineered fill provided they comply with the requirements of satisfactory soil materials as described above.

C. Borrow/Imported Fill Material: Soil excavated from site or imported conforming to requirements for fill material shall conform to Division 31: Earthwork.

D. Engineered Fill: Satisfactory soil materials/borrow fill material, as described above, placed in lifts no greater than eight inches (8") thick (loose measurements) and each lift moisture conditioned. All engineered fill should be densified to a minimum relative compaction of 90 percent per ASTM D1557.

E. Backfill Material for Trenches: The onsite soils have been determined to be suitable for being used for backfilling purposes in trenches. Utility trenches should be backfilled with granular materials and mechanically compacted to at least 90 percent of the maximum dry density of the soils.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Drawings may not indicate in detail all demolition work to be carried out. Carefully examine existing conditions to determine full extent of demolition required. All utilities, whether shown on Drawings or not, to be capped at the property line Unless Noted Otherwise.

B. Repair damage due to demolition activities to existing improvements to remain at no additional cost to Owner. Repair or replace as directed by Owner's inspector.

C. Take measures to avoid excessive damage from inadequate or improper means and methods, or improper shoring, bracing, or support. Repair or replace any resulting damage at no additional cost to Owner as directed by Owner's inspector.

D. If conditions are encountered that vary from those indicated, notify Owner's inspector for instructions prior to proceeding. Owner assumes no responsibility for actual condition of structures to be demolished.

E. Inform Owner immediately upon discovery of asbestos products, radioactive materials, toxic wastes, or other hazardous materials. Do not remove hazardous materials without Owner authorization.

F. Adjacent roadways/passageways:
   1. Maintain fire department access through all phases of the Project.
   2. Obstruction of streets, walks, or other adjacent facilities will not be allowed.

3.2 DIG ALERT NOTIFICATION

A. Before any excavation in or near the public right-of-way, Contractor must contact the Underground Service Alert or USA-North (Dig Alert) at 811 or 800-642-2444 for information on buried utilities and pipelines.

B. Delineation of the proposed excavation site is mandatory. Mark the area to be excavated with water soluble or chalk based white paint on paved surfaces or with other suitable markings such as flags or stakes on unpaved areas.

C. Call at least two (2) full working days prior to digging.

D. If the members (utility companies) have facilities within the work area, they will mark them prior to the start of excavation; if not, they will provide notice of no conflict. A different color is used for each utility type (electricity is marked in red, gas in yellow, water in blue, sewer in green, telephone and cable TV in orange).

3.3 GENERAL

A. Protection:
   1. Do not begin demolition until safety partitions, barricades, warning signs, and other forms of protection are installed.
   2. Provide safeguards, including warning signs, lights and barricades, for protection of occupants and the general public during demolition.
   3. Provide and maintain fire extinguishers. Comply with requirements of governing authorities.
   4. Maintain existing utilities that are to remain in service and protect from damage during operations.

B. Safety: If at any time safety of existing construction appears to be endangered, take immediate measures to correct such conditions; cease operations and immediately notify Owner's inspector. Do not resume demolition until directed by Owner's inspector.

C. Noise and Dust Abatement: Exercise all reasonable and necessary means to abate dust, dirt rising, and undue noise. Perform necessary sprinkling and wetting of construction site to allay dust as required by applicable codes and ordinances.

D. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations. Do not create hazardous or objectionable conditions, such as flooding and pollution, when using water.

E. Water for Dust Control: Contractor shall obtain and pay for all water required for dust control operations. This may include, but is not limited to, payment of deposits to utility for construction meter, and payment of all monthly service and water charges. Construction meter shall be in place throughout construction period unless alternative arrangements are made with the City of XXXXX to provide construction water for all purposes. Contractor shall be aware of water moratoriums and restrictions, and shall immediately advise Owner of effects on construction schedules.

F. An eight-foot-high (8') chain link fence and gates shall be erected prior to any demolition operations at the construction limits perimeter. Coordinate the exact location with Owner.

G. Debris Removal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.

H. Progress Cleaning: Clean adjacent buildings and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before start of demolition.

I. Where performing contracted scope of work requires coring of existing concrete, brick masonry, or CMU structures (including walls, floors, and sitework), Contractor shall obtain and document means of verifying existence and location of embedded steel reinforcing materials within said concrete, brick, and CMU assemblies. Contractor shall locate reinforcement by means of noninvasive technology, such as X-ray photography, for the purposes of protecting said reinforcement in place and shall not damage any reinforcement materials (rebar, etc.) unless specifically detailed as such and approved by the authority having jurisdiction.

J. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

K. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives,

acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

L. Contractor shall provide temporary weather protection during interval between demolition and removal of existing construction, on exterior surfaces, and new construction to ensure that no water leakage or damage occurs to structure or interior areas.

M. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to be selectively demolished.

N. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

O. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials if exposed; repaired surfaces shall match existing adjacent surface color finish and texture:
   1. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.

P. Disposal: Promptly dispose of demolished materials; do not allow demolished materials to accumulate onsite.

3.4 PREPARATION

A. Prevent movement or settlement of adjacent structures. Provide bracing and shoring as necessary.

B. Utilities:
   1. The Drawings do not purport to show all below-grade conditions and objects on the site. Contractor shall perform field investigations as necessary to establish location of underground utility services and other features affecting earthwork.
   2. Mark location of underground utilities on asphalt pavement with paint.
   3. Disconnect and cap utility services; comply with requirement of governing authorities.
   4. Contractor shall arrange and notify utility company in advance of date and time when service needs to be disconnected.
   5. Do not commence demolition operations until associated disconnections have been completed.
   6. Should utilities and other below-grade conditions be encountered that adversely affect the Work, discontinue affected Work and notify Owner's representative and Architect and request direction. Unforeseen conditions will be resolved in accordance with provisions of the General Conditions of the Contract.
   7. Should a utility line or structure be damaged, immediately notify the responsible utility company or agency and notify Owner’s representative and Architect:
      a. Repair or replace all damaged utility lines and structures as directed by the responsible utility company or agency.
      b. Repair or replacement of damaged utility lines and structures whose location or existence has been made known to Contractor shall be at no change in the Contract Time and Contract price.

C. Structures to be demolished shall be inspected for hazardous materials; such materials shall be removed and disposed of before general demolition begins.

D. Do not interrupt existing utilities serving occupied or operating facilities, except when

authorized in writing by Owner's representative and authority having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner's representative and authority having jurisdiction.

3.5 EXPLOSIVES

A. Explosives: Use of explosives will not be permitted.

3.6 DEMOLITION

A. Demolition, General:
   1. With certain exceptions, Contractor shall raze, remove, and dispose of all buildings and foundations, structures, paving, fences, and other obstructions that lie wholly or partially within the construction limits identified on Drawings. The exceptions are utility-owned equipment and any other items the Owner/Documents may direct Contractor to leave intact or re-use onsite. Cease demolition immediately if adjacent structures appear to be in danger.
   2. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
   3. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner's representative and authority having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
   4. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area:
      a. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
      b. Protect existing site improvements, appurtenances, and landscaping to remain.
      c. Completely remove below-grade construction, including foundation walls and footings.
   5. Filling below-grade areas: Completely fill below-grade areas and voids resulting from demolition of buildings and pavement with soil materials according to requirements specified in Division 31:
   6. Damages: Promptly repair damages to adjacent facilities caused by demolition operations.
   7. Unless otherwise indicated on the Plans, remove all demolished material from the site and dispose of at approved disposal sites. Comply with all requirements for recycling of demolished material as called for in Division 01 of this Specification. Contractor shall obtain necessary permits for the transportation of material from the site.

3.7 REMOVAL OF EXISTING PLUMBING AND ELECTRICAL EQUIPMENT AND SERVICES

A. Remove existing plumbing and electrical equipment fixtures and services not indicated for reuse and not necessary for completion of Work. Remove abandoned lines and cap unused portions of existing lines. Contractor is responsible for completely surveying the site and locating all existing utilities, above and below ground, before contracting to perform the work.

B. Asbestos – Cement (A-C) Pipe Removal and Disposal: The Plans for the Project may indicate that existing asbestos-cement pipe is to be removed from the ground. Where so indicated, Contractor shall excavate with care, expose the pipeline, and remove the A-C pipe to the nearest joint. Should the Plans not call out the removal of the A-C pipe and A-C pipe is encountered, Contractor shall obtain approval from Owner as to whether or not the A-C pipe is to be removed or can be left in place. Cutting of the pipe shall only be done if there is no other way to expose the length of pipe to the nearest joint that be separated and Owner approves the cutting of the pipe. Cutting of the pipe shall be done with a mechanical saw

with a pressure water source to dampen the pipe and the dust from the cutting. To remove a coupling, the coupling may have to be broken in the trench. The pipe once removed from the trench may be broken for handling. The breaking shall be done within a plastic bagging or sheeting material to minimize the release of asbestos fibers into the atmosphere. Once removed and broken, if necessary, the A-C material shall be bagged and disposed of legally with Owner being given a copy of all Contractor paperwork as to the legal disposal of the material. If the A-C pipe section(s) are removed intact, the pipe can be removed by Contractor from the Project site and become the property and responsibility of Contractor.

3.8 CLEANING

A. Clean existing materials to remain, using appropriate tools and materials.

B. Protect adjacent materials and equipment during cleaning operations.

3.9 RESTORATION

A. Restoration of Site Finishes:
   1. Concrete paving: Where it is necessary to excavate a trench across, make a cut in concrete paved areas, cut concrete with cutting saw, full depth of paving.
   2. Bituminous paving: Where it is necessary to excavate a trench across, make a cut in bituminous paved areas, either first score paving with a concrete cutting saw, in neat straight lines, prior to removing paving, or make straight cuts with pneumatic spade.
   3. Restoration of paving: Restore all paved areas to their original condition using material of like type and quality as the removed paving. Paving in public ways shall conform to applicable requirements of authorities having jurisdiction. Repaired surfaces shall match existing adjacent paving except minimum depth shall be 3-1/2 inches where existing paving is less than 3-1/2 inches.
   4. Restoration of landscape planting: Restore soil and plant materials to match original condition, including additional topsoil, topsoil grading and preparation, new plant materials, and plant maintenance during establishment period.

3.10 MAINTENANCE

A. Install and maintain all erosion control devices, including sandbag and gravel bag dikes, silt fences, de-silting basins, inlet barricades, vehicle wash traps, and other features called for in the Storm Water Pollution Prevention Plan and Temporary Erosion Control Plans.

3.11 CLEAN-UP/DISPOSAL

A. Coordinate building access with the Owner’s inspector. Review and schedule waste storage and removal, include truck access to site.

B. Debris shall be dampened by fog water spray prior to transporting by truck.

C. Debris pick-up area shall be kept broom-clean and shall be washed daily with clean water.

D. Remove waste and debris other than items to be salvaged. Turn over salvaged items to Owner, or store and protect for reuse where scheduled. Continuously clean-up and remove items as demolition work progresses. Do not allow waste and debris to accumulate in building or onsite.

END OF SECTION 02 41 13

SECTION 02 41 16 STRUCTURE DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Demolition and removal of existing buildings including existing site features or elements associated as indicated on Drawings.
2. Removing below-grade under existing buildings all electrical, plumbing, and landscape irrigation elements outwards to a minimum of five feet (5') in any direction.
3. Disconnect, cap or seal, and abandoning in-place all site utilities to an area designated on Drawings.
4. Remove all utilities, power, and water and provide new utilities to new location.
5. Salvaging items for reuse by Owner.

B. Related Sections:
1. Section 01 73 29: Cutting and Patching.
2. Section 01 74 19: Construction Waste Management and Disposal.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse or store. Include fasteners or brackets needed for reattachment elsewhere.

1.4 SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.

B. Proposed Protection Measures:
1. 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:
a. Adjacent buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.

C. Schedule of Building Demolition Activities:
1. Indicate the following:
a. Detailed sequence of demolition work, with starting and ending dates for each activity.
b. Temporary interruption of utility services.
c. Shutoff and capping or re-routing of utility services.

D. Pre-Demolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, which might be misconstrued as damage

caused by demolition operations. Comply with Division 01: General Requirements. Submit before the Work begins.

E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

F. Inventory: Submit a list of items that have been removed and salvaged. Refer to Section 01 74 19: Construction Waste Management and Disposal.

1.5 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

1.6 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

B. Pre-demolition conference to be conducted at Project site:
1. Inspect and discuss condition of construction to be demolished.
2. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review and finalize protection requirements.
4. Review procedures for noise control and dust control.
5. Review procedures for protection of adjacent buildings.
6. Review items to be salvaged and returned to Owner.

C. Arrange demolition schedule so as not to interfere with Owner's onsite operations or operations of adjacent occupied buildings.

D. Arrange demolition schedule so as not to interfere with work performed by other contractors onsite. Coordinate work for equipment used to not deter or stop work by others.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner:
1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

C. Onsite storage or sale of removed items or materials is not permitted.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Division 31.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.

B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted:
   1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings:
      a. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings:
         1) Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical:
   1. Before building demolition, Owner will remove the following items (TBD):

D. Hazardous Materials:
   1. It is not expected that hazardous materials will be encountered in the Work:
      a. Hazardous materials will be removed by Owner before start of the Work.
      b. If elements suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

3.2 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Review Project record documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project record documents.

C. Engage a professional Engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

E. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations. Comply with Division 01: General Requirements.

3.3 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

B. Salvaged Items:

1. Clean salvaged items of dirt and demolition debris.
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 storage area.
5. Protect items from damage during transport and storage.

3.4 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Utilities to be Disconnected:
   1. Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished:
      a. Owner will arrange to shut off utilities when requested by Contractor.
      b. Arrange to shut off utilities with utility companies.
      c. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
      d. Cut off pipe or conduit a minimum of 24 inches (610 mm) below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
      e. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.5 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Temporary Shoring:
   1. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished:
      a. Strengthen or add new supports when required during progress of demolition.

C. Existing Utilities to Remain:
   1. Maintain utility services to remain and protect from damage during demolition operations:
      a. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
      b. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction:
         1) Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

D. Temporary Protection:
   1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 01 50 00: Temporary Facilities and Controls:
      a. Protect adjacent buildings and facilities from damage due to demolition activities.
      b. Protect existing site improvements, appurtenances, and landscaping to remain.
      c. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
      d. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
      e. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.

f. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
g. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.6 DEMOLITION, GENERAL

A. Demolish indicated buildings and site elements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
2. Maintain fire watch during and for at least two (2) hours after flame-cutting operations.
3. Maintain adequate ventilation when using cutting torches.
4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls:
1. Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities:
a. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
b. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.7 DEMOLITION BY EXPLOSIVES

A. **No explosives** are to be used on this Project.

3.8 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent:
1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

C. Salvage:
1. Items to be removed and salvaged are indicated below:
a. Doors and door hardware.
b. Windows.
c. Cabinets.
d. Mirrors.
e. Chalkboards.

f. Tackboards.
g. Marker boards.
h. Plumbing fixtures.

D. Below-Grade Construction: Abandon foundation walls and other below-grade construction. Cut below-grade construction flush with grade.

E. Existing Utilities:
1. Demolish existing utilities and below-grade utility structures that are within five feet (5') outside footprint indicated for new construction. Abandon utilities outside this area.
a. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Division 31.

F. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

G. Hydraulic Elevator Systems: No system on Project.

3.9 SITE RESTORATION

A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.

B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.10 REPAIRS

A. Promptly repair damage to adjacent buildings caused by demolition operations.

B. Promptly repair damaged sidewalks, roadways, fencing, or retaining walls to nearest expansion joint. Replace in-kind or as designated by Architect.

3.11 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction and recycle or dispose of them according to Section 01 74 19: Construction Waste Management and Disposal:
1. Do not allow demolished materials to accumulate onsite.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn demolished materials.

3.12 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began. Clean roadways of debris caused by debris transport.

END OF SECTION 02 41 16

SECTION 02 82 00 ASBESTOS REMEDIATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Asbestos material abatement and disposal.
   2. Accessories necessary for complete removal.

1.3 SUBMITTAL

A. Submit copy of the signed waste manifests indicating the place, time, and exact quantity of asbestos received by an approved landfill.

1.4 QUALITY ASSURANCE

A. Qualifications: Entity having minimum five (5) years' documented experience, holding required current licenses for the removal, transport, disposal, and related activities relative to the work, having the required personal protective equipment for abatement operations, with current liability insurance, and who employs workers fully trained and knowledgeable in the removal of hazardous materials.

B. Stop Asbestos Removal:
   1. If a verbal or written Stop Asbestos Removal Order is given**,** immediately stop asbestos removal and maintain HEPA filtered negative pressure air flow in the containment and adequately wet any exposed Asbestos Contained Material (ACM).
   2. Do not resume asbestos removal activity until authorized to do so in writing from District.
   3. A stop asbestos removal order may be issued at any time by the District if it is determined that abatement conditions/activities are not within regulatory requirements or that an imminent hazard exists to human health or the environment.
   4. Work stoppage will continue until conditions have been corrected.

PART 2 MATERIALS (NOT USED)

PART 3 EXECUTION

3.1 REMEDIATION

A. Owner has conducted an asbestos survey and has determined that asbestos may be present in areas where Work will be performed. The survey is made available for review:
   1. As part of the Work, Owner requires asbestos removal to be performed under the construction Contract.
   2. Asbestos may be present in vinyl tile under architectural woodwork or covered by, but not encapsulated, carpet materials and other types of flooring.
   3. Asbestos may be present in the ductwork above the ceiling panels.
   4. If asbestos is found, stop work in the area and engage an asbestos removal firm to

remediate the asbestos from the area. Do not resume work in the affected areas until the abatement is complete and authorization to proceed with work in the affected areas is given. Work in areas not affected by asbestos may continue.

B. Assume responsibility and liability for compliance with applicable federal, state, and local regulations related to the asbestos abatement work:
   1. Provide and maintain training, accreditations, medical exams, medical records, and personal protective equipment (PPE) including respiratory protection and respirator fit testing, as required by applicable federal, state, and local regulations.
   2. Post required notices prior to the commencement of the work.
   3. Restrict access to containment areas to authorized, trained, and protected personnel.
   4. Prepare and post an emergency plan in clean room and equipment room of the decontamination unit.
   5. Do not permit workers to eat, drink, smoke, chew gum or tobacco, or break the protection of the respiratory protection system in the work area.

C. Entering and Existing Procedures: Establish procedures for entering and existing containment area. Provide personnel decontainment unit with disposable coveralls, head covers, and clean respirators. Provide shower room between personnel decontainment area and equipment room.

D. Decontamination Procedures: Establish and ensure that procedures for decontamination upon leaving containment area are in accordance with federal and state regulations.

E. Provide negative pressure filtration systems to complete air exchange four (4) times per hour. Provide standby system in the event of a machine failure or emergency:
   1. Continuously monitor and record the pressure differential between the work area and the building outside of the work area.

F. Prepare the Affected Area: Remove furnishings and materials to the extent necessary to remediate the asbestos.

G. Containment of Areas:
   1. Provide a secure containment work area in accordance with federal and state regulations. Avoid damage to existing partitions and ceilings scheduled to remain to the extent possible:
      a. Establish critical barriers over each opening into the work area.
      b. Close out vents and air ducts to prevent particulates from entering the HVAC system.

H. Debris:
   1. Place contaminated debris in a designated location within the containment area:
      a. Place debris in minimum six (6) mil poly bags before removing from contaminated areas. Pass clean or decontaminated bags through a double six (6) mil flap doorway into another bag or fiber drum. Remove to disposal dumpster/gondola/vehicle. Do not permit unprotected personnel to come in contact with contaminated bags.
      b. Remove and dispose of contaminated debris legally.

I. Testing: Perform required tests and inspections upon completion of the work. Collect air samples and analyze in accordance with regulations. Upon satisfactory conclusion of testing, remove critical barriers.

J. After thorough decontamination, complete asbestos abatement work upon meeting the regulated area clearance criteria and fulfilling the following:

1. Remove equipment, materials, and debris from the Project area.
2. Package and dispose of asbestos waste, as required.
3. Repair or replace all interior finishes damaged during the abatement work.
4. Fulfill other Project closeout requirements as specified elsewhere in this Specification.

3.2 CERTIFICATE OF COMPLETION BY CONTRACTOR

A. Submit a signed *Certificate of Completion* at the completion of the abatement and decontamination of the regulated area.

END OF SECTION 02 82 00

SECTION 02 83 00 LEAD REMEDIATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
1. Recognition of lead-based material and its definition.
2. Federal and state requirement reference.
3. Contractor’s Liability.
4. Contractor’s Acknowledgment.

B. Lead as a Health Hazard:
1. Lead poisoning is recognized as a serious environmental health hazard facing children today. Even at low levels of exposure - much lower than previously believed - lead can impair the development of a child's central nervous system, causing learning disabilities and leading to serious behavioral problems. Lead enters the environment as tiny lead particles and lead dust disburses when paint chips or chalks peels or wears away over time, or is otherwise disturbed. Ingestion of lead dust is the most common pathway of childhood poisoning; lead dust gets on a child’s hands and toys and then into a child’s mouth through common hand-to-mouth activity. Exposures may result from construction or remodeling activities that disturb lead paint, from ordinary wear and tear of windows and doors, or from friction on other surfaces.
2. Ordinary construction and renovation or repainting activities carried out without lead-safe work practices can disturb lead-based paint and create significant hazards. Improper removal practices, such as dry scraping, sanding, or water blasting painted surfaces, are likely to generate high volumes of lead dust.
3. Because Contractor and his employees will be providing services for the District, and because Contractor's work may disturb lead-containing building materials, CONTRACTOR IS HEREBY NOTIFIED of the potential presence of lead-containing materials located within certain buildings utilized by the District. All school buildings built prior to 1978 are presumed to contain some lead-based paint until sampling proves otherwise.
4. Refer to “Asbestos and Lead-Based Paint Survey Report – Appendix A” in this Project manual.
5. Education Code section 32240 et seq. is known as the Lead-Safe Schools Protection Act. Under this act, the Department of Health Services is to conduct a sample survey of schools in the State of California for the purpose of developing risk factors to predict lead contamination in public schools (Ed. Code, § 32241).
6. Any school that undertakes any action to abate existing risk factors for lead is required to utilize trained and state-certified contractors, inspectors, and workers (Ed. Code, § 32243, sub. [b]). Moreover, lead-based paint, lead plumbing, solders, or other potential sources of lead contamination shall not be utilized in the construction of any new school facility, or the modernization or renovation of any existing school facility (Ed. Code, § 32244).
7. Both the Federal Occupational Safety and Health Administration (Fed/OSHA) and the California Division of Occupational Safety and Health (Cal/OSHA) have implemented safety orders applicable to all construction work where a contractor's employee may be occupationally exposed to lead.
8. The OSHA Regulations contain specific and detailed requirements imposed on

contractors subject to that regulation. The OSHA Regulations define construction work as work for construction, alteration, and/or repair, including painting and decorating. It includes, but is not limited to, the following:

a. Demolition or salvage of structures where lead or materials containing lead are present.
b. Removal or encapsulation of materials containing lead.
c. New construction, alteration, repair, or renovation of structures, substrates, or portions thereof that contain lead, or materials containing lead.
d. Installation of products containing lead.
e. Lead contamination/emergency cleanup.
f. Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed.
g. Maintenance operations associated with the construction activities described in Section 01 78 23: Operation and Maintenance Data, or within this Section.

9. Because it is assumed by the District that a portion of painted surfaces (interior as well as exterior) within the District contain some level of lead, it is imperative that Contractor, workers, and subcontractors fully and adequately comply with all applicable laws, rules, and regulations governing lead-based materials, including title 8, California Code of Regulations, section 1532.1.
10. Contractor shall notify the District if any Work may result in the disturbance of lead-containing building materials. Any and all Work that may result in the disturbance of lead-containing building materials shall be coordinated through the District. A signed copy of this Certification shall be on file prior to beginning Work on the Project, along with all current insurance certificates.

C. Renovation, Repair, and Painting Rule:
1. Toxic Substance Control Act Section 402(a):
a. The EPA requires lead safe work practices to reduce exposure to lead hazards created by renovation, repair, and painting activities that disturb lead-based paint. Pursuant to the Renovation, Repair and Painting Rule (RRP), renovations in homes, childcare facilities, and schools built prior to 1978 must be conducted by certified renovations firms, using renovators with training by a EPA-accredited training provider, and fully and adequately complying with all applicable laws, rules, and regulations governing lead-based materials, including those rules and regulations appearing within title 40 of the Code of Federal Regulations as part 745 (40 CFR 745).
b. The RRP requirements apply to all contractors who disturb lead-based paint in a six (6) square foot or greater area indoors or a 20 square foot or greater area outdoors. If a DPH-certified inspector or risk assessor determines that a structure constructed before 1978 is lead-free, the federal certification is not required for anyone working on that particular building.

1.3 SUBMITTAL

A. Contractors Acknowledgment (bottom of Section).

B. Submit copy of the signed waste manifests indicating the place, time, and exact quantity of material received by an approved landfill.

1.4 CONTRACTOR'S LIABILITY

A. If Contractor fails to comply with any applicable laws, rules, or regulations, and that failure results in a site or worker contamination, Contractor will be held solely responsible for all costs involved in any required corrective actions, and shall defend, indemnify, and hold harmless the District, pursuant to the indemnification provisions of the Contract, for all damages and other claims arising therefrom.

B. If lead disturbance is anticipated in the Work, only persons with appropriate accreditation, registrations, licenses, and training shall conduct this Work.

C. It shall be the responsibility of Contractor to properly dispose of any and all waste products, including, but not limited to, paint chips, any collected residue, or any other visual material that may occur from the prepping of any painted surface. It will be the responsibility of Contractor to provide the proper disposal of any hazardous waste by a certified hazardous waste hauler. This company shall be registered with the Department of Transportation (DOT) and shall be able to issue a current manifest number upon transporting any hazardous material from any Project site.

D. Contractor shall provide the District with any sample results prior to beginning Work, during the Work, and after the completion of the Work. The District may request to examine, prior to the commencement of the Work, the lead training records of each employee of Contractor.

SECTION CONTINUES ON NEXT PAGE

CONTRACTOR HEREBY ACKNOWLEDGES UNDER PENALTY OF PERJURY THAT IT:

1. HAS RECEIVED NOTIFICATION OF POTENTIAL LEAD-BASED MATERIALS ON

OWNER'S PROPERTY;

2. IS KNOWLEDGEABLE REGARDING AND WILL COMPLY WITH ALL APPLICABLE LAWS, RULES, AND REGULATIONS GOVERNING WORK WITH, AND DISPOSAL OF, LEAD.

THE UNDERSIGNED WARRANTS THAT HE/SHE HAS THE AUTHORITY TO SIGN ON BEHALF OF AND BIND CONTRACTOR. THE DISTRICT MAY REQUIRE PROOF OF SUCH AUTHORITY.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

PROJECT/CONTRACT NO.: _____ (Project or Contract)

between XX District (District) and _____ (Contractor or Bidder).

This certification provides notice to Contractor that:

1. Contractor's work may disturb lead-containing building materials.

2. Contractor shall notify the District if any work may result in the disturbance of lead-containing building materials.

3. Contractor shall comply with the Renovation, Repair, and Painting Rule, if lead-based paint is disturbed in a six (6) square-foot or greater area indoors or a 20-square-foot or greater area outdoors.

END OF SECTION 02 83 00

SECTION 02 87 13 MOLD REMEDIATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This specification covers the removal and disposal of mold. Products shall be as follows or as directed by the Owner. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

B. Related Sections:
1. Section 01 35 46: Indoor Air Quality Procedure.
2. Section 01 45 23: Testing and Inspecting Services.
3. Section 02 41 13: Selective Demolition.

C. References:
1. U.S. EPA “Mold Remediation in Schools and Commercial Buildings” 2. U.S. EPA “A Brief Guide to Mold, Moisture, and Your Home.”

1.3 DEFINITIONS

A. Experienced: When used with an entity or individual, experienced means having successfully completed a minimum of five (5) years’ documented experience with projects similar in nature, size, and extent; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Field Quality Control Testing: Tests and inspections performed onsite for work scheduled to be performed and upon completed Work.

C. Installer/Applicator/Erector:
1. Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform particular services, including installation, erection, application, and similar operations for replacement or modifications:
   a. Use of trade specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

1.4 SUBMITTALS

A. List of all personnel to be involved in the work with their training and certifications.
1. List of all products and procedures proposed for use in performance of the work.
2. Test reports.
3. Certificates.
4. Preliminary Visual Assessment Reports.
   a. Photos.
   b. Maps of areas needing remediation.
   c. Approximate Square footage of each area needing remediation.
5. Submit Product Data and Safety Data Sheets for all materials brought on the site to be

used.

B. Proposed Schedule
1. Provide documentation for proposed schedule of work, include inspection and reasonable amount of time for settlement of materials and equipment.

1.5 QUALITY ASSURANCE

A. Conform to all Federal, State, and Local regulations which govern the handling and disposal of mold materials.

B. For areas requiring containment, Contractor to provide bilingual warning signage outside remediation areas. Including yellow caution tape and signage with large black letters:
1. Signage to read: “Warning DO NOT ENTER remediation work in progress”.

PART 2 PRODUCT - (NOT USED)

PART 3 EXECUTION

A. Environmental Assessment:
1. The presence of mold, water damage, or musty odors shall be addressed immediately. In all instances, any source(s) of water must be stopped and the extent of water damaged determined.
2. Water damaged materials shall be dried and repaired.
3. Mold damaged materials shall be remediated in accordance with this document.
   a. Visual Inspection: A visual inspection is the most important initial step in identifying a possible contamination problem. The extent of any water damage and mold growth shall be visually assessed. This assessment is important in determining remedial strategies.
   b. Ventilation systems shall also be visually checked, particularly for damp filters but also for damp conditions elsewhere in the system and overall cleanliness.
   c. Ceiling tiles, gypsum wallboard (sheetrock), cardboard, paper, and other cellulosic surfaces shall be given careful attention during a visual inspection.
4. The use of equipment such as a boroscope, to view spaces in ductwork or behind walls, or a moisture meter, to detect moisture in building materials, may be helpful in identifying hidden sources of fungal growth and the extent of water damage.
5. Bulk/Surface Sampling:
   a. Bulk or surface sampling is not required to undertake a remediation. Remediation of visually identified fungal contamination shall proceed without further evaluation.
   b. Bulk or surface samples may need to be collected to identify specific fungal contaminants as part of a medical evaluation if occupants are experiencing symptoms which may be related to fungal exposure or to identify the presence or absence of mold if a visual inspection is equivocal (e.g., discoloration, and staining).
   c. An individual trained in appropriate sampling methodology shall perform bulk or surface sampling.
      1) Bulk samples shall be collected from visibly moldy surfaces by scraping or cutting materials with a clean tool into a clean plastic bag.
      2) Surface samples shall be collected by wiping a measured area with a sterile swab or by stripping the suspect surface

B. Existing Conditions
1. Surface sampling is less destructive than bulk sampling. Other sampling methods may also be available. A laboratory specializing in mycology shall be consulted for specific

sampling and delivery instructions.

2. Air Monitoring:
   a. Air sampling for fungi shall not be part of a routine assessment. This is because decisions about appropriate remediation strategies can usually be made on the basis of a visual inspection. In addition, air-sampling methods for some fungi are prone to false negative results and therefore cannot be used to definitively rule out contamination.
   b. Air monitoring may be necessary if an individual(s) has been diagnosed with a disease that is or may be associated with a fungal exposure (e.g., pulmonary hemorrhage/hemosiderosis, and aspergillosis).
   c. Air monitoring may be necessary if there is evidence from a visual inspection or bulk sampling that ventilation systems may be contaminated. The purpose of such air monitoring is to assess the extent of contamination throughout a building. It is preferable to conduct sampling while ventilation systems are operating.
   d. Air monitoring may be necessary if the presence of mold is suspected (e.g., musty odors) but cannot be identified by a visual inspection or bulk sampling (e.g., mold growth behind walls).
      1) The purpose of such air monitoring is to determine the location and/or extent of contamination. e. If air monitoring is performed, for comparative purposes, outdoor air samples shall be collected concurrently at an air intake, if possible, and at a location representative of outdoor air. For additional information on air sampling, refer to the American Conference of Governmental Industrial Hygienists' document, "Bioaerosols: Assessment and Control."
   e. Personnel conducting the sampling shall be trained in proper air sampling methods for microbial contaminants. A laboratory specializing in mycology shall be consulted for specific sampling and shipping instructions.
   f. Analysis of Environmental Samples:
      1) Microscopic identification of the spores/colonies requires considerable expertise. These services are not routinely available from commercial laboratories. Documented quality control in the laboratories used for analysis of the bulk/surface and air samples is necessary. The American Industrial Hygiene Association (AIHA) offers accreditation to microbial laboratories (Environmental Microbiology Laboratory Accreditation Program (EMLAP)). Accredited laboratories must participate in quarterly proficiency testing (Environmental Microbiology Proficiency Analytical Testing Program (EMPAT)).
   g. Evaluation of bulk/surface and air sampling data shall be performed by an experienced health professional. The presence of few or trace amounts of fungal spores in bulk/surface sampling shall be considered background. Amounts greater than this or the presence of fungal fragments (e.g., hyphae, and conidiophores) may suggest fungal colonization, growth, and/or accumulation at or near the sampled location. Air samples shall be evaluated by means of comparison (i.e., indoors to outdoors) and by fungal type (e.g., genera, and species). In general, the levels and types of fungi found should be similar indoors (in non-problem buildings) as compared to the outdoor air. Differences in the levels or types of fungi found in air samples may indicate that moisture sources and resultant fungal growth may be problematic.

C. Remediation General:
   1. In all situations, the underlying cause of water accumulation must be rectified or fungal growth will recur. Any initial water infiltration shall be stopped and cleaned immediately. An immediate response (within 24 to 48 hours) and thorough clean up, drying, and/or removal of water damaged materials will prevent or limit mold growth.
   2. If the source of water is elevated humidity, relative humidity shall be maintained at levels below 60% to inhibit mold growth.

3. Emphasis shall be on ensuring proper repairs of the building infrastructure, so that water damage and moisture buildup does not recur.
4. Five different levels of abatement are described in this section (Below).
5. The size of the area impacted by fungal contamination primarily determines the type of remediation. The sizing levels below are based on professional judgment and practicality; currently there is not adequate data to relate the extent of contamination to frequency or severity of health effects. The goal of remediation is to remove or clean contaminated materials in a way that prevents the emission of fungi and dust contaminated with fungi from leaving a work area and entering an occupied or non-abatement area, while protecting the health of workers performing the abatement. The listed remediation methods were designed to achieve this goal, however, due to the general nature of these methods it is the responsibility of the people conducting remediation to ensure the methods enacted are adequate. The listed remediation methods are not meant to exclude other similarly effective methods. Any changes to the remediation methods listed in these guidelines, however, shall be carefully considered prior to implementation.
6. Non-porous (e.g., metals, glass, and hard plastics) and semi-porous (e.g., wood, and concrete) materials that are structurally sound and are visibly moldy can be cleaned and reused. Cleaning shall be done using a detergent solution. Porous materials such as ceiling tiles and insulation, and wallboards with more than a small area of contamination shall be removed and discarded. Porous materials (e.g., wallboard, and fabrics) that can be cleaned, can be reused, but should be discarded if possible. A professional restoration consultant shall be contacted when restoring porous materials with more than a small area of fungal contamination. All materials to be reused shall be dry and visibly free from mold. Routine inspections shall be conducted to confirm the effectiveness of remediation work.
7. The use of gaseous, vapor-phase, or aerosolized biocides for remedial purposes is not recommended. The use of biocides in this manner can pose health concerns for people in occupied spaces of the building and for people returning to the treated space if used improperly. Furthermore, the effectiveness of these treatments is unproven and does not address the possible health concerns from the presence of the remaining non-viable mold. For additional information on the use of biocides for remedial purposes, refer to the American Conference of Governmental Industrial Hygienists' document, "Bioaerosols: Assessment and Control."

D. **Level I:** Small Isolated Areas (10 sq. ft or less) - e.g., ceiling tiles, small areas on walls.
1. Remediation can be conducted by regular building maintenance staff. Such persons shall receive training on proper clean up methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).
2. Respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection shall be worn.
3. The work area shall be unoccupied. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants (less than 12 months old), persons recovering from recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity, pneumonitis, and severe allergies).
4. Containment of the work area is not necessary. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.
5. Contaminated materials that cannot be cleaned shall be removed from the building in a sealed plastic bag. There are no special requirements for the disposal of moldy materials.
6. The work area and areas used by remedial workers for egress shall be cleaned with a damp cloth and/or mop and a detergent solution. g. All areas shall be left dry and visibly free from contamination and debris.

E. **Level II:** Mid-Sized Isolated Areas (10 - 30 sq. ft.) - e.g., individual wallboard panels.
   1. Remediation can be conducted by regular building maintenance staff. Such persons shall receive training on proper clean up methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).
   2. Respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection shall be worn.
   3. The work area shall be unoccupied. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity, pneumonitis, and severe allergies).
   4. The work area shall be covered with a plastic sheet(s) and sealed with tape before remediation, to contain dust/debris.
   5. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.
   6. Contaminated materials that cannot be cleaned shall be removed from the building in sealed plastic bags. There are no special requirements for the disposal of moldy materials
   7. The work area and areas used by remedial workers for egress shall be HEPA vacuumed (a vacuum equipped with a High-Efficiency Particulate Air filter) and cleaned with a damp cloth and/or mop and a detergent solution.
   8. All areas shall be left dry and visibly free from contamination and debris.

F. **Level III:** Large Isolated Areas (30 - 100 square feet) - e.g., several wallboard panels.
   1. A health and safety professional with experience performing microbial investigations shall be consulted prior to remediation activities to provide oversight for the project.
   2. The following procedures at a minimum are recommended:
      a. Personnel trained in the handling of hazardous materials and equipped with respiratory protection, (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection shall be worn.
      b. The work area and areas directly adjacent shall be covered with a plastic sheet(s) and taped before remediation, to contain dust/debris.
      c. Seal ventilation ducts/grills in the work area and areas directly adjacent with plastic sheeting.
      d. The work area and areas directly adjacent shall be unoccupied. Further vacating of people from spaces near the work area is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity, pneumonitis, and severe allergies).
      e. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.
      f. Contaminated materials that cannot be cleaned shall be removed from the building in sealed plastic bags. There are no special requirements for the disposal of moldy materials.
      g. The work area and surrounding areas shall be HEPA vacuumed and cleaned with a damp cloth and/or mop and a detergent solution.
      h. All areas shall be left dry and visibly free from contamination and debris.
   3. If abatement procedures are expected to generate a lot of dust (e.g., abrasive cleaning of contaminated surfaces, demolition of plaster walls) or the visible concentration of the fungi is heavy (blanket coverage as opposed to patchy), then it is recommended that the remediation procedures for Level IV are followed.

G. **Level IV:** Extensive Contamination (greater than 100 contiguous square feet in an area)

1. A health and safety professional with experience performing microbial investigations shall be consulted prior to remediation activities to provide oversight for the project. The following procedures are recommended:
   a. Personnel trained in the handling of hazardous materials equipped with:
      1) Full-face respirators with high efficiency particulate air (HEPA) cartridges.
      2) Disposable protective clothing covering both head and shoes.
      3) Gloves.
   b. Containment of the affected area:
      1) Complete isolation of work area from occupied spaces using plastic sheeting sealed with duct tape (including ventilation ducts/grills, fixtures, and any other openings).
      2) The use of an exhaust fan with a HEPA filter to generate negative pressurization.
      3) Airlocks and decontamination room.
   c. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity, pneumonitis, and severe allergies).
   d. Contaminated materials that cannot be cleaned shall be removed from the building in sealed plastic bags. The outside of the bags shall be cleaned with a damp cloth and a detergent solution or HEPA vacuumed in the decontamination chamber prior to their transport to uncontaminated areas of the building. There are no special requirements for the disposal of moldy materials.
   e. The contained area and decontamination room shall be HEPA vacuumed and cleaned with a damp cloth and/or mop with a detergent solution and be visibly clean prior to the removal of isolation barriers.
   f. Air monitoring shall be conducted prior to occupancy to determine if the area is fit to reoccupy.

H. **Level V:** Remediation of HVAC Systems.
   1. A Small Isolated Area of Contamination (<10 square feet) in the HVAC System 1) Remediation can be conducted by regular building maintenance staff. Such persons shall receive training on proper clean up methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).
      a. Respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection shall be worn.
      b. The HVAC system shall be shut down prior to any remedial activities. 4) The work area shall be covered with a plastic sheet(s) and sealed with tape before remediation, to contain dust/debris.
      c. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.
      d. Growth supporting materials that are contaminated, such as the paper on the insulation of interior lined ducts and filters, shall be removed. Other contaminated materials that cannot be cleaned shall be removed in sealed plastic bags. There are no special requirements for the disposal of moldy materials.
      e. The work area and areas immediately surrounding the work area shall be HEPA vacuumed and cleaned with a damp cloth and/or mop and a detergent solution.
      f. All areas shall be left dry and visibly free from contamination and debris.
      g. A variety of biocides are recommended by HVAC manufacturers for use with HVAC components, such as, cooling coils and condensation pans. HVAC manufacturers shall be consulted for the products they recommend for use in their systems.
   2. Areas of Contamination (>10 square feet) in the HVAC System: A health and safety

professional with experience performing microbial investigations shall be consulted prior to remediation activities to provide oversight for remediation projects involving more than a small isolated area in an HVAC system. The following procedures are recommended:

a. Personnel trained in the handling of hazardous materials equipped with:
    1) Respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended.
    2) Gloves and eye protection
    3) Full-face respirators with HEPA cartridges and disposable protective clothing covering both head and shoes shall be worn if contamination is greater than 30 square feet. 2)
b. The HVAC system shall be shut down prior to any remedial activities.
c. Containment of the affected area:
    1) Complete isolation of work area from the other areas of the HVAC system using plastic sheeting sealed with duct tape.
    2) The use of an exhaust fan with a HEPA filter to generate negative pressurization.
    3) Airlocks and decontamination room if contamination is greater than 30 square feet.
d. Growth supporting materials that are contaminated, such as the paper on the insulation of interior lined ducts and filters, shall be removed. Other contaminated materials that cannot be cleaned should be removed in sealed plastic bags. When a decontamination chamber is present, the outside of the bags shall be cleaned with a damp cloth and a detergent solution or HEPA vacuumed prior to their transport to uncontaminated areas of the building. There are no special requirements for the disposal of moldy materials.
e. The contained area and decontamination room shall be HEPA vacuumed and cleaned with a damp cloth and/or mop and a detergent solution prior to the removal of isolation barriers.
f. All areas shall be left dry and visibly free from contamination and debris.
g. Air monitoring shall be conducted prior to re-occupancy with the HVAC system in operation to determine if the area(s) served by the system are fit to reoccupy.
h. A variety of biocides are recommended by HVAC manufacturers for use with HVAC components, such as, cooling coils and condensation pans. HVAC manufacturers shall be consulted for the products they recommend for use in their systems.

3. Hazard Communication: When fungal growth requiring large-scale remediation is found, the building owner, management, and/or employer shall notify occupants in the affected area(s) of its presence. Notification shall include a description of the remedial measures to be taken and a timetable for completion. Group meetings held before and after remediation with full disclosure of plans and results can be an effective communication mechanism. Individuals with persistent health problems that appear to be related to bioaerosol exposure should see their physicians for a referral to practitioners who are trained in occupational/environmental medicine or related specialties and are knowledgeable about these types of exposures. Individuals seeking medical attention shall be provided with a copy of all inspection results and interpretation to give to their medical practitioners.

3.2 CLOSEOUT DOCUMENTATION

A. Documents required at closeout of project:
    1. Daily logs.
        a. Brief description of work activities.
        b. Number of personnel on site.
        c. Type of equipment used.

d. Type of Products Used.
e. List of any non-compliance noted, emergencies, stop work orders(with detailed explanations)
f. Photographic logs.
g. Report certifying remediation is complete.

END OF SECTION 02 87 13

SECTION 03 10 00 CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section is related to concrete forming and accessories and includes:
   1. Formwork for cast-in-place concrete, with shoring, bracing, and anchorage.
   2. Installation of items to be embedded in concrete, such as anchor bolts, inserts, embeds, and sleeves.
   3. Openings for other work.
   4. Form accessories.
   5. Form stripping.

B. Related Sections:
   1. Section 03 20 00: Concrete Reinforcing.
   2. Section 03 30 00: Cast-in-Place Concrete.

C. Reference Standards:
   1. ACI 117 Standard Specifications for Tolerances for Concrete Construction and Materials.
   2. ACI 301 Specifications for Structural Concrete.
   3. ACI 318-14 Building Code Requirements for Structural Concrete and Commentary.
   4. ACI 347 Guide to Formwork for Concrete.
   5. National Institute of Standards and Technology - PS 1 Structural Plywood.
   6. 2022 California Building Code, Chapter 19A.
   7. APA American Plywood Association Design and Construction Guide.
   8. Local AQMD - XXAir Quality Management District.

1.3 SUBMITTALS

A. See Section 01 33 00: Submittal Procedures.

B. Product Data: Provide data on void form materials and installation requirements.

C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties. Review and approval will not include form strength and adequacy.

D. Keep an accurate record of the dates of removal of forms, form shores and reshores, and furnish copies to the SEOR.

1.4 QUALITY ASSURANCE

A. Comply with the pertinent provisions of Section 01 40 00: Quality Requirements.

B. Construct forms according to ACI 347, "Guide to Formwork for Concrete," and conforming to tolerances of ACI 117, "Standard Specifications for Tolerances for Concrete Construction and Materials."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 60 00: Product Requirements, delivering materials in a timely manner to ensure uninterrupted progress.

B. Store prefabricated forms off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 PRODUCTS

2.1 FORMWORK - GENERAL

A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.

B. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions.

C. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

D. Comply with relevant portions of ACI 347, ACI 301, and ACI 318.

2.2 WOOD FORM MATERIALS

A. Softwood Plywood: PS 1, B-B Medium or High Density Concrete Form Overlay, Class I, grade marked, not mill oiled.

B. Lumber: DF species; WCLIB Construction grade or better, WWPA No. 1 grade or better; with grade stamp clearly visible.

2.3 REMOVABLE PREFABRICATED FORMS

A. Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set; two inches (2”) thick.

2.4 FORMWORK ACCESSORIES

A. Form Ties: Prefabricated rod, flat band, wire, internally threaded disconnecting type, or equal, not leaving metal within 1-1/2 inches of concrete surface.

B. Form Release Agent:
   1. Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bug holes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied:
      a. Composition: Colorless reactive, mineral oil-based, soy-based, or vegetable oil-based compound.
      b. Do not use materials containing diesel oil or petroleum-based compounds.
      c. VOC content: In compliance with applicable local, state, and federal regulations.

C. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Division 05: Metals.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify lines, levels, and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.

3.2 EARTH FORMS

A. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete. Sides of all footings and grade beams shall be formed, unless the member detail provides at least three inches (3") clear cover to reinforcement and indicates the member is cast against earth. Remove formwork prior to backfilling operations.

3.3 ERECTION - FORMWORK

A. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301.

B. Rigidly construct forms to prevent mortar leakage, sagging, displacement, or bulging between studs. Use clean, sound, approved form material, coated with specified materials only, not oil. Provide backing on all plywood joints.

C. Coat forms with the specified resin coating, not form oil. Construct forms to exact shapes, sizes, lines, and dimensions required to obtain level, plumb, and straight surfaces. Provide openings, offsets, keys, reglets, anchorages, recesses, moldings, chamfers, blocking, screeds, drips, bulkheads, and all other required features. Make forms easily removable without hammering or prying against concrete. Space forms apart with metal spreaders. Construct forms to accurate alignment, locations, and grades, and provide against sagging, leakage of concrete mortar, or displacement occurring during and after placing of concrete. Coordinate installation of inserts and anchors in forms according to shop drawings and requirements for Work of other Sections.

D. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

E. Corners and angles: Provide 3/4-inch by 3/4-inch beveled chamfer strips for all exposed concrete corners and angles square unless indicated otherwise.

F. Reglets and Rebates: Form required reglets and rebates to receive frames, flashing, and other equipment. Obtain required dimensions, details, and precise positions for Work to be installed under other Sections and form concrete accordingly.

G. Form Joints: Align joints and make watertight. Keep form joints to a minimum. Fill joints to produce smooth surfaces, intersections, and arises. Use polymer foam or equivalent fillers at joints and where forms abut or overlap existing concrete to prevent leakage of mortar.

H. Recesses, Drips, and Profiles: Provide smooth milled wood or pre-formed rubber or plastic shapes of types shown and required.

I. Cleanouts and Cleaning: Provide temporary openings in all wall forms and other vertical forms for cleaning and inspection. Clean forms and surfaces to receive concrete prior to placing.

J. Re-Use: Clean and recondition form material before re-use.

3.4 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. All necessary pipe sleeves, anchors, or other required inserts shall be accurately installed as part of the work of other Sections, according to Section 03 30 00: Cast-In-Place Concrete, for submittal requirements related to this scope.

B. Obtain approval before framing openings in structural members that are not indicated on Drawings.

C. Provide formed openings where required for items to be embedded in passing through concrete work.

D. Locate and set in place items that will be cast directly into concrete.

E. Conduits or Pipes:
1. Locate so as not to reduce strength of the concrete.
2. Do not place pipes, other than conduits, in a slab 4-1/2 inches thick or less in any case. Conduit buried in a concrete slab shall not have an outside dimension greater than 1/3 the slab thickness nor be placed below the bottom reinforcing or over the top reinforcing.
3. Sleeves: Pipe sleeves may pass through the slab or walls if not exposed to rusting or other deterioration and are of uncounted or galvanized iron or steel. Provide sleeves of diameter large enough to pass any hub or coupling on pipe, including any insulation.
4. Conduits may be embedded in walls only if the outside diameter does not exceed 1/3 the wall thickness, are spaced no closer than three (3) diameters on centers, and not impair the strength of the structure.

F. Coordinate with work of other Sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

G. Install accessories in accordance with manufacturer's instructions so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.

H. Install waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement. Heat seal joints so they are watertight.

I. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

J. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fit so joints will not be apparent in exposed concrete surfaces.

3.6 FORM CLEANING

A. Clean forms as erection proceeds to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

3.7 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.

B. Deflection: Limit deflection of forming surfaces from concrete pressure to L/240.

C. Finish Lines:
1. Position formwork to maintain hardened concrete finish lines within following permissible deviations:
   a. Variation from plumb:

In 10'-0"	1/4 inch
In any story or 20'-0"	3/8 inch
In 40'-0" or more	3/4 inch

   b. Variation from level or grades indicated:

In 10'-0"	1/4 inch
In any story or 20'-0"	3/8 inch
In 40'-0" or more	3/4 inch

   c. Cross-sectional dimensions:

Minus	1/4 inch
Plus	1/2 inch

3.8 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00: Quality Requirements.

B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

3.9 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and all superimposed loads as determined by testing field cured cylinders, but not sooner than specified in ACI 347. Load supporting forms may be removed when concrete has attained 75 percent of required 28-day compressive strength, but no sooner than three (3) days, provided construction is reshored. Vertical formwork for cast-in-place concrete walls may be removed no sooner than one (1) day following concrete placement, provided that Contractor can demonstrate that no sloughing or sagging of concrete will occur:
1. Reshore structural members as specified per ACI 347.
2. Remove formwork progressively so unbalanced loads are not imposed on the structure.
3. Avoid damage to concrete surfaces during removal.
4. Remove formwork in same sequence as concrete placement to achieve similar concrete surface coloration.

END OF SECTION 03 10 00

SECTION 03 15 00 CONCRETE ACCESSORIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes wheel stops.

1.3 SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of exposed finish requiring color selection.

C. Samples for Verification: For wheel stops, six inches (150 mm) long showing color and cross section, with fasteners.

PART 2 PRODUCTS

2.1 PARKING BUMPERS

A. Concrete Wheel Stops:
   1. Precast, steel-reinforced, air-entrained concrete, 4,000-psi (27.6-MPa) minimum compressive strength, 4-1/2 inches (115 mm) high by nine inches (225 mm) wide by 72 inches (1,800 mm) long. Provide chamfered corners, transverse drainage slots on underside, and a minimum of two (2) factory-formed or drilled vertical holes through wheel stop for anchoring to substrate:
      a. Surface appearance: Free of pockets, sand streaks, honeycombs, and other obvious defects. Corners shall be uniform, straight, and sharp.
      b. Mounting hardware: Galvanized-steel hardware as standard with wheel-stop manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that pavement is in suitable condition to begin installation according to manufacturer's written instructions.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 WHEEL STOP INSTALLATION

A. General: Install wheel stops according to manufacturer's written instructions unless otherwise indicated.

B. Install wheel stops in bed of adhesive before anchoring.

C. Securely anchor wheel stops to pavement with hardware in each preformed vertical hole in wheel stop as recommended in writing by manufacturer. Recess head of hardware beneath top of wheel stop.

END OF SECTION 03 15 00

SECTION 03 20 00 CONCRETE REINFORCING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section is related to concrete reinforcement and includes:
   1. Reinforcing steel for cast-in-place concrete foundations.
   2. Reinforcing steel for cast-in-place concrete slabs-on-grade.
   3. Supports and accessories for steel reinforcement.

B. Related Sections:
   1. Section 03 10 00: Concrete Forming and Accessories.
   2. Section 03 30 00: Cast-in-Place Concrete.

C. Reference Standards:
   1. ACI 301 Specifications for Structural Concrete.
   2. ACI 318 Building Code Requirements for Structural Concrete and Commentary.
   3. ACI SP-066 ACI Detailing Manual.
   4. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
   5. ASTM A706/A706M Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
   6. ASTM A775/A775M Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
   7. ASTM D3963/D3963M Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.
   8. AWS D1.4 Structural Welding Code - Reinforcing Steel.
   9. CRSI Concrete Reinforcing Steel Institute Manual of Standard Practice.
   10. CRSI Concrete Reinforcing Steel Institute Placing Reinforcing Bars.

1.3 SUBMITTALS

A. See Section 01 33 00: Submittal Procedures.

B. Shop Drawings:
   1. Comply with requirements of ACI SP-066. Include the following:
      a. Complete bar layout.
      b. Representative sections.
      c. Details for congested conditions.
      d. Proposed layout where vertical and horizontal bars intersect.
      e. Bar schedules.
      f. Typical bending diagrams and offsets.
      g. Shapes of bent bars.
      h. Spacing of bars.
      i. Splice lengths and locations.

C. Where welding is proposed:
   1. Detail welding to conform to AWS D1.4.
   2. Submit copies of welding operator's certificate.

3. Where reinforcement complying with ASTM A615 is to be welded, chemical tests shall be performed to determine the weldability in accordance with ACI 318.
4. Weld procedure specifications (WPS):
   a. All WPS's shall be submitted to the Structural Engineer of Record (SEOR) for review and approval prior to use.
   b. For WPS's that have been qualified by test, the supporting Procedure Qualification Record (PQR) shall be submitted to the SEOR for review and approval.
   c. Included shall be WPS for repair welds.

D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.4 QUALITY ASSURANCE

A. Comply with the pertinent provisions of Section 01 40 00: Quality Requirements.

B. Perform work of this Section in accordance with ACI 301.

C. Welders' Certificates: Submit certifications for welders employed on the Project, verifying AWS qualification within the previous 12 months.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 60 00: Product Requirements, delivering materials in a timely manner to ensure uninterrupted progress.

B. Bundle bars, tag with identification, and transport and store so as not to damage any material. Use metal tags indicating size, length, and other marking shown on placement drawings. Maintain tags after bundles are broken.

C. Avoid exposure to dirt, moisture, or conditions harmful to reinforcement.

D. Extra Material:
1. Provide an allowance of an additional ten percent (10%) of the total reinforced steel tonnage in addition to the quantities shown on the Drawings. This additional steel shall be installed in sizes and locations as directed by the structural Engineer.

PART 2 PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel:
1. ASTM A615/A615M, Grade 60 (60,000 psi) bar #5 and above:
   a. Deformed billet-steel bars.
   b. Unfinished.
   c. Only to be used for conditions where bars will not be welded.
2. ASTM A615/A615M, Grade 40 (40,000 psi) bars #3 & #4:
   d. Deformed billet-steel bars.
   e. Unfinished.
   f. Only to be used for conditions where bars will not be welded.

B. Reinforcing Steel:
1. ASTM A706/A706M, Grade 60 (60,000 psi) bar #5 and above:
   a. Unfinished.

b. Used in all cases where welding of bars is required.
2. ASTM A615/A615M, Grade 40 (40,000 psi) bars #3 & #4:
c. Deformed billet-steel bars.
d. Unfinished.
e. Only to be used for conditions where bars will not be welded.

C. Reinforcement Accessories:
1. Tie wire: ASTM A1064, annealed copper bearing steel, minimum 16 gage, 0.0508 inch.
2. Chairs, bolsters, bar supports, spacers:
a. Sized and shaped for adequate support of reinforcement during concrete placement. Standard manufactured products shall conform to the Concrete Reinforcing Institute Manual of Standard Practice, latest edition.
3. Use dense precast concrete supports with embedded wire ties for reinforcement placed on grade. Elsewhere, use wire bar supports.

D. Welding electrodes: AWS D1.4, Table 5.1 and 5.3, low hydrogen electrodes, E8018 for Grade 60 steel.

2.2 REBAR SPLICING

A. Coupler Systems: Mechanical devices for splicing reinforcing bars conforming to the requirements of ACI 318; capable of developing 1.25fy of the steel reinforcing yield strength in tension and compression.

B. Dowel Bar Splicer with Dowel-Ins:
1. Mechanical devices for connecting dowels; capable of developing full steel reinforcing design strength in tension and compression.
a. Products:
1) Dayton Superior Corporation; Dowel Bar Splicer D101A with Straight Dowel-In: www.daytonsuperior.com.
2) Lenton Form Savers (IAPMO-ES 129).

2.3 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI - Manual of Standard Practice.

B. Bending and Forming:
1. Fabricate bars of the indicated sizes and bend and form to required shapes and lengths by methods not injurious to materials.
2. Do not heat reinforcement for bending.
3. Bend bars No. 6 size and larger in the shop only.
4. Bars with unscheduled kinks or bends are subject to rejection.
5. Use only tested and approved bar materials.

C. Welding:
1. Use only ASTM A706 steel where welding is proposed:
a. Perform welding where shown or approved, by the direct electric arc process in accordance with AWS D1.4 using specified low hydrogen electrodes.
b. Preheat six inches (6") each side of joint.
c. Protect joints from drafts during the cooling process; accelerated cooling is prohibited.
d. Do not tack weld bars.
e. Welding shall not be done on or within two (2) bar diameters of any bent portion of a bar that has been bent cold.

f. Welding of crossing bars shall not be permitted for assembly reinforcement unless authorized by the SEOR.
g. Clean metal surfaces to be welded of all loose scale and foreign material.
h. Clean welds each time electrode is changed and chip burned edges before placing welds.
i. When wire brushed, the completed welds must exhibit uniform section, smooth welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion and penetration to the base metal.
j. Cut out welds or parts of welds found defective with chisel and replace with proper welding.
k. Fillet welds may be considered prequalified per AWS D1.4.
l. Other welds are to be qualified per AWS D1.4.

D. Where ASTM A615 steel is to be used or occurs in existing elements and is to be welded:
1. Complete chemical analyses shall be performed to determine chemical composition and, for a new bar, provided in the mill certifications to determine weldability in accordance with ACI 318 with modifications per AWS D1.4.
2. The carbon equivalency (CE) shall be clearly defined and bars with a CE above 0.75 shall not be welded.
3. Welding Procedure Specifications and supporting PQRs with required testing per AWS D1.4 shall be provided for review and approval prior to welding.
4. These WPS and PQRs shall be specific to the CE as determined above, and shall, in addition to the other AWS requirement, include minimum and maximum preheat and interpass temperatures that are specified to the CE. This preheat and interpass temperature shall be strictly enforced in the field.
5. If separate shipments of bars vary the weldability, the process listed in the above requirements shall be repeated for these new bars.

E. Locate reinforcing splices not indicated on Drawings at point of minimum stress. Review locations of splices with SEOR.

PART 3 EXECUTION

3.1 PLACEMENT

A. Before placing bars, and again before concrete is placed, clean bars of loose rust and/or mill scale, dirt, oil, or any other coating that may be deleterious or could reduce bond with the concrete.

B. Securing in place:
1. Accurately place bars and wire tie in precise position where bars cross.
2. Bend ends of wire ties away from the forms.
3. Wire tie bars to the corners of ties and stirrups.
4. Support bars according to the Concrete Reinforcing Steel Institute (CRSI) "Placing Reinforcing Bars," using approved accessories and chairs.
5. Place precast concrete cubes with embedded wire ties to supporting reinforcing steel bars in concrete placed on grade and in footings.
6. Take adequate precautions to ensure that reinforcing bar position and spacing is maintained during concrete placement.

C. Do not displace or damage vapor barrier.

D. Maintain concrete cover around reinforcing per requirements on Drawings.

E. Splices:

1. Do not splice reinforcing bars at the points of maximum stress except where indicated.
2. Lap splices as shown or required to develop the full strength or stress of the bars.
3. Stagger splices in horizontal wall bars at least 48 inches longitudinally in alternate bars and opposite faces.

F. Field Welding: As specified for fabrication.

3.2 FIELD QUALITY CONTROL

A. Comply with all pertinent provisions of Section 01 40 00: Quality Requirements.

B. Supervision: Perform Work to this Section under supervision of a capable superintendent.

C. An independent testing agency, as specified in Section 01 40 00: Quality Requirements, shall inspect installed reinforcement for conformance to Contract Documents before concrete placement.

D. Where welding is done in the shop or at the site, perform welding of reinforcing bars under inspection of the testing laboratory welding inspector in accordance with Chapter 17 of the CBC. The welding inspector shall make a systematic record of all welds:
1. Identification marks of welders.
2. List of defective welds.
3. Manner of correction of defects:
    a. The welding inspector shall check the material, equipment details of construction and procedures, as well as the welds. The inspector shall check the ability of the welder. The welding inspector shall furnish the structural Engineer and the enforcement agency with a verified report that the welding required to be inspected is proper and has been done in conformity with the approved Plans and Specifications. The welding inspector shall use all means necessary to determine the quality of the weld. The inspector may use gamma ray, magnaflux, trepanning, sonics, or any other aid to visual inspection, which the inspector may deem necessary to assure the adequacy of the welding.

END OF SECTION 03 20 00

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Footings and foundation walls.
   2. Interior slabs-on-grade.
   3. Exterior slabs-on-grade.

B. Special Coordination Requirements: Coordinate with the work of the following Sections to identify the finish flooring manufacturer's concrete slab requirements. Such requirements may be over and above the requirements of the Contract Documents and may require additional materials, means, or methods, which shall be included as part of the Work.

C. Related Sections:
   1. Section 01 32 00: Construction Progress Documentation.
   2. Section 03 10 00: Concrete Forming and Accessories.
   3. Section 03 20 00: Concrete Reinforcing.
   4. Section 03 35 00: Concrete Finishing.
   5. Division 22: Plumbing.
   6. Division 23: Mechanical.
   7. Division 26: Electrical.

1.3 DEFINITIONS

A. Cementitious Materials:
   1. Portland cement alone or in combination with one or more of the following, subject to compliance with requirements:
      a. Blended hydraulic cement.
      b. Fly ash and other pozzolans.
      c. Ground granulated blast-furnace slag.
      d. Silica fume.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Certificates: Weighmaster's certificates.

E. Material Certificates:
1. For each of the following, signed by manufacturers:
   a. Cementitious materials.
   b. Admixtures.
   c. Waterstops.
   d. Curing materials.
   e. Floor and slab treatments.
   f. Bonding agents.
   g. Adhesives.
   h. Vapor retarders.
   i. Semi-rigid joint filler.
   j. Joint-filler strips.
   k. Repair materials.

F. Material Test Reports:
1. For the following, from a qualified testing agency, indicating compliance with requirements:
   a. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
   b. Vapor retarder: Provide third part documentation that all testing was performed on a single production roll and a summary of test results per ASTM E1745.

1.5 QUALITY ASSURANCE

A. Codes and Standards:
1. Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
   a. 2022 California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA).
   b. American Concrete Institute (ACI) Publications:
      1) Comply with the following unless modified by requirements in the Contract Documents:
         a) ACI 301, "Specifications for Structural Concrete."
         b) ACI 117, "Specification for Tolerances for Concrete Construction and Materials and Commentary."
         c) ACI 302.1R, “Guide to Concrete Floor and Slab Construction.”
         d) ACI 302.2R, “Guide for Concrete Slabs that receive Moisture-Sensitive Flooring Materials.”
         e) ACI 305R, “Guide to Hot Weather Concreting.”
         f) ACI 306R, “Guide to Cold Weather Concreting.”
         g) ACI 318, “Building Code Requirements for Structural Concrete and Commentary.”
2. Floor leveling to be FF50 (Minimum FF35, approval by Architect) and tested per ASTM E1155 following ACI 117 using 3D laser imaging to meet requirement unless otherwise noted ono Drawings.

B. Manufacturer Qualifications:
1. A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment:
   a. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Source Quality Control: Furnish Weighmaster’s certificates for all concrete.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."

E. Concrete Testing Service: Engage a qualified independent testing agency approved by DSA to perform material evaluation tests and to design concrete mixtures.

F. Pre-Installation Meeting: Conduct meeting onsite. Include product and material manufacturers.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete:
   1. Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in large sizes to minimize number of joints:
      a. Plywood, metal, or other approved panel materials.
      b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
         1) High-density overlay, Class 1 or better.
         2) Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
         3) Structural 1, B-B or better; mill oiled and edge sealed.
         4) B-B (concrete form), Class 1 or better; mill oiled and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4-inch by 3/4-inch minimum.

D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

E. Form-Release Agent:
   1. Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces:
      a. Formulate form-release agent with rust inhibitor for steel form-facing materials.

F. Form Ties:
   1. Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal:
      a. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60.

B. Welded Reinforcing Bars: Low-alloy-steel reinforcing bars, ASTM A706/A706M, deformed.

C. Do not use reinforcement having any of the following defects:
1. Bar lengths, depths, or bends exceeding the specified fabricating tolerances.
2. Bends or kinks not indicated on the Drawings or required for this Work.
3. Bars with cross-section reduced due to excessive rust or other causes.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports:
1. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
a. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material:
1. Use the following cementitious materials, of the same type, brand, and source, throughout Project:
a. Portland Cement - ASTM C150, Type I/II. Supplement with the following:
1) Fly Ash: ASTM C618, Class F.

B. Normal-Weight Aggregates:
1. ASTM C33:
a. Maximum coarse-aggregate size: Per plan.
b. Fine aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C94 and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260.

B. Chemical Admixtures:
1. Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride:
a. Water-reducing admixture: ASTM C494/C494M, Type A.
b. Retarding admixture: ASTM C494/C494M, Type B.
c. Water-reducing and retarding admixture: ASTM C494/C494M, Type D.
d. High-range, water-reducing admixture: ASTM C494/C494M, Type F.
e. High-range, water-reducing and retarding admixture: ASTM C494/C494M, Type G.
f. Plasticizing and retarding admixture: ASTM C1017/C1017M, Type II.

C. Integral Waterproofing Admixtures:
1. ASTM C494, Type S, complex catalyzed hydrous silicate, water and vapor proofing liquid admixture:
a. Product: Subject to compliance with requirements, provide Moxie International Inc.; Moxie Shield 1800 Concrete Admixture, P.O. Box 838 Loomis, CA 95650; Contact Manufacturer’s representative: P:916-251-0825, F: 877-330-1930 Email: info@moxieshield.com.
b. Properties:

1) Water/cement ratio: Maximum 0.52.
2) Water vapor transmission: Less than 0.1 perms (5.7 g/Pa-s-m2).
3) Water seepage or permeability: Not to exceed 7.00 x 10-9 cm/s @ 50psi (2.3 x 10-10 ft/s).

2. Products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.6 VAPOR RETARDERS

A. Sheet Vapor Retarder:
1. ASTM E1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape:
a. Products are subject to compliance with requirements. Acceptable products:
1) Stego Industries, LLC: Stego Wrap 15 mil Class A.
2) Grace Construction Products: Florprufe 120.
3) W. R. Meadows, Inc.: Perminator 15 mil.
4) Substitutions with Architect’s approval, and pursuant to conditions of Divisions 00 and 01.

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D448, Size 57, with 100 percent passing a 1-1/2-inch sieve and zero to five percent (0%-5%) passing a No. 8 sieve.

2.7 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately nine-ounces-per-square-yard when dry.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

2.8 RELATED MATERIALS

A. Non-Shrink Grout:
1. Factory premixed grout; ASTM C1107.
2. Compressive strength: 7,000 psi at 28 days.

B. Exterior Concrete Walks: Provide a capillary break consisting of two inches (2”) of clean dry sand, ASTM C33, evenly spread on top of the compacted subgrade.

2.9 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301:
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
2. All concrete mix designs shall be prepared and stamped by a California registered civil Engineer.

B. Cementitious Materials:
1. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

a. Fly Ash: 15 to 25 percent.

C. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings and Foundation Walls, Concrete Stairs, and Concrete Walls:
1. Proportion normal-weight concrete mixture as follows:
a. Minimum compressive strength: 3,000 psi at 28 days unless otherwise noted.
b. Maximum water-cementitious materials ratio: 0.55.
c. Minimum cementitious materials content: 5.5 sacks of cement per cubic yard.
d. Slump limit: Four inches (4”), plus or minus one inch (1”).

B. Interior Slabs-on-Grade:
1. Proportion normal-weight concrete mixture as follows:
a. Minimum compressive strength: 3,000 psi at 28 days.
b. Maximum water-cementitious materials ratio: 0.45.
c. Minimum cementitious materials content: Six (6) sacks of cement per cubic yard.
d. Slump limit: Four inches (4”), plus or minus one inch (1”).

C. Exterior Slabs-on-Grade:
1. Proportion normal-weight concrete mixture as follows:
a. Minimum compressive strength: 3,000 psi at 28 days.
b. Maximum water-cementitious materials ratio: 0.55.
c. Minimum cementitious materials content: 5.5 sacks of cement per cubic yard.
d. Slump limit: Four inches (4”), plus or minus one inch (1”).

2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete:
1. Measure, batch, mix, and deliver concrete according to ASTM C94/C94M, and furnish batch ticket information:
a. When air temperature is between 85 and 90 degrees F, reduce mixing and delivery time from 90 minutes to 75 minutes; when air temperature is above 90 degrees F reduce mixing and delivery time to 60 minutes.

2.13 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment:
1. Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces:
a. Basis-of-design product: Subject to compliance with requirements, provide Moxie International Inc.; **Moxie Shield 1500 Concrete Sealer or Moxie Shield MFSII Flooring Sealer**, P.O. Box 838 Loomis, CA 95650; Contact Manufacturer’s representative: P:916-251-0825, F: 877-330-1930 Email: info@moxieshield.com.
b. Products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

PART 3 EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Construct forms tight enough to prevent loss of concrete mortar.

D. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

E. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded. In no case shall any bolt or anchor be stabbed in place while or after the concrete is poured:
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 SHORES AND RESHORES

A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring:
   1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.4 VAPOR RETARDERS

A. Sheet Vapor Retarders:
   1. Place, protect, and repair sheet vapor retarder according to ASTM E1643 and manufacturer's written instructions:
      a. Lap joints six inches (6”) and seal with manufacturer's recommended tape.
      b. Seal all penetrations (including pipes) per manufacturer’s tape.
      c. No penetration of the vapor barrier is allowed except for reinforcing and permanent utilities.
      d. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area six inches (6”) and taping all four sides with tape.
      e. Do not saturate the sand cushion.
      f. If sand is saturated prior to placement of concrete, remove the sand and replace.
      g. Protect all installed moisture barrier construction from precipitation and water penetration by covering and providing positive drainage away from the moisture barrier.
      h. Cover slab openings and block-outs around columns to prevent water penetration

of moisture barrier.

3.5 STEEL REINFORCEMENT

A. General:
   1. Comply with CRSI's "Manual of Standard Practice" for placing reinforcement:
      a. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
      b. Clean reinforcement and remove loose dust and mill scale, earth, oil, and other materials that reduce bond or destroy bond with concrete.
      c. Position, support, and secure reinforcement against displacement by forms, construction, and the concrete placement operations. Provide metal chairs, dobies, or other aids manufactured for this purpose.
      d. Place reinforcement to obtain the required concrete coverages for concrete protection.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

C. Contraction Joints in Slabs-on-Grade:
   1. Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one inch (1”) as follows:
      a. Grooved joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
      b. Sawed joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide, 1/3-inch depth joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. Saw cut slab as soon as surface has hardened to where it can support the equipment and operator, normally within two (2) hours after finishing. Use saw designed for cutting fresh concrete, such as “Soff-Cut” or equal.

D. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate 1/2 of dowel length to prevent concrete bonding to one side of joint.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Deposit concrete continuously in one (1) layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation:
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to

ACI 301.

3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least six inches (6") into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete:
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement:
   1. Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures:
      a. When average high and low temperature is expected to fall below 40 degrees F for three (3) successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
      b. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
      c. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement:
   1. Comply with ACI 301 and as follows:
      a. Maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
      b. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish:
   1. As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities:
      a. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish:
   1. As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities:
      a. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish:

1. Apply the following to smooth-formed finished as-cast concrete where indicated:
   a. Smooth-rubbed finish: Not later than one (1) day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
   b. Grout-cleaned finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one-part portland cement to 1-1/2-parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
   c. Cork-floated finish: Wet concrete surfaces and apply a stiff grout. Mix one-part portland cement and one-part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces 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 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Except as may be shown otherwise on Drawings, provide the following finishes at the indicated locations.

B. Scratch Finish:
   1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction:
      a. Apply scratch finish to surfaces that are to receive concrete floor toppings or mortar setting beds for bonded cementitious floor finishes.

C. Float Finish:
   1. Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture:
      a. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish:
   1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings:
      a. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic, or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
      b. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, ten-foot-long (10') straightedge resting on two (2) high spots and placed anywhere on the surface does not exceed 1/8 inch.

c. Contractor shall anticipate that grinding will be required as a result of curling or other slab defects. Grinding required to bring the slab surface into acceptable tolerances for finished flooring installation shall be included as part of the Work.

E. Trowel and Fine-Broom Finish:
1. Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom:
a. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

3.10 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
1. Moisture curing: Keep surfaces continuously moist for not less than seven (7) days.
2. Moisture-retaining-cover curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven (7) days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.11 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.12 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:
1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests:
1. Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:

a. Testing frequency: Obtain one (1) composite sample for each day's pour of each concrete mixture exceeding five (5) cubic yards, but less than 25 cubic yards, plus one (1) set for each additional 50 cubic yards or fraction thereof.
b. Testing frequency:
    1) Obtain at least one (1) composite sample for each 50 cubic yards or fraction thereof of each concrete mixture placed each day, but not less than once for each 2,000 square feet of surface area for slabs or walls:
        a) When frequency of testing will provide fewer than five (5) compressive-strength tests for each concrete mixture, testing shall be conducted from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.
c. Slump: ASTM C143/C143M; one (1) test at point of placement for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
d. Air content: ASTM C231, pressure method, for normal-weight concrete; one (1) test for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture.
e. Concrete temperature: ASTM C1064/C1064M; one (1) test hourly when air temperature is 40 degrees F and below and when 80 degrees F and above, and one test (1) for each composite sample.
f. Unit weight: ASTM C567, fresh unit weight of structural lightweight concrete; one (1) test for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture.
g. Compression Test Specimens:
    1) ASTM C31/C31M:
        a) Cast and laboratory cure two (2) sets of two (2) standard cylinder specimens for each composite sample.
        b) Cast and field cure two (2) sets of two (2) standard cylinder specimens for each composite sample.
h. Compressive-strength tests:
    1) ASTM C39/C39M; test one (1) set of two (2) laboratory-cured specimens at seven (7) days and one (1) set of two (2) specimens at 28 days:
        a) Test one (1) set of two (2) field-cured specimens at seven (7) days and one (1) set of two (2) specimens at 28 days.
        b) A compressive-strength test shall be the average compressive strength from a set of two (2) specimens obtained from same composite sample and tested at age indicated.
i. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
j. Strength of each concrete mixture will be satisfactory if every average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength.
k. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven (7) and 28-day tests.
l. Nondestructive testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
m. Additional tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive

strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.

n. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
o. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 03 30 00

SECTION 03 35 00 CONCRETE FINISHING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Deep penetrating concrete floor sealer.
   2. Accessories necessary for a complete installation

B. Related Sections:
   1. Section 03 20 00: Concrete Reinforcing.
   2. Section 03 30 00: Cast-In-Place Concrete.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, application instructions, and recommendations. Include data substantiating product complies with requirements of the Contract Documents.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Building Code: Comply with applicable requirements for interior finishes in 2022 California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA).

B. Accessibility Requirements:
   1. Comply with applicable requirements:
      a. Americans with Disabilities Act of 1990, as amended:
         1) ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.
      b. 2022 California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA).
      c. CBC Chapter 11B, Access to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.

C. Manufacturer Qualifications: Provide products produced by a company specializing in production of concrete sealers for minimum of five (5) years.

PART 2 PRODUCTS

2.1 MATERIAL

A. Concrete Sealer: Deep penetrating sealer, water based, clear, non-yellowing, nontoxic, VOC compliant concrete sealer, integral with concrete through chemical reaction forming nonsoluble seal within pores and capillaries of concrete and sealing it against ingress of moisture while allowing concrete to breathe.

B. Basis of Design:

1. Product: Subject to compliance with requirements, provide **Moxie International Inc.; Moxie Shield 1500 Concrete Sealer**, P.O. Box 838 Loomis, CA 95650; Contact Manufacturer's representative: P:916-251-0825, F: 877-330-1930 Email: info@moxieshield.com.
   a. PROSOCO, Inc.
   b. W.R. Meadows.

C. Physical Properties:
1. Permeability: Maximum 0.093 ml/m^2/s.
2. Specific gravity: 1.094.
3. PH: 11.50.
4. Flash point: Nonflammable.
5. Chemical identity: Mixture containing silicates, bonding catalysts, and inert materials.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Requirements: Do not proceed with installation until areas to receive work are enclosed and temperature and relative humidity are stabilized and maintained for optimum quality control.

B. Environmental Limitations:
1. Comply with coating manufacturer's written instructions for substrate temperature, ambient temperature, humidity, ventilation, and conditions affecting floor treatment application. Do not apply coating until wet work in spaces is complete and dry; and overhead work, including installing mechanical systems, lighting, and athletic equipment, is complete:
   a. Apply floor coatings when substrate temperature and surrounding air temperatures are between 50 degrees F and 95 degrees F (10 degrees C and 35 degrees C).
   b. Do not apply floor coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces.

3.2 EXAMINATION

A. Examine substrates for conditions affecting performance and conditions of floor treatment:
1. Verify compatibility with and suitability of substrates, including existing finishes or primers.
2. Verify plasticizers in existing concrete substrate will not impair bond.
3. Proceed with installation after correcting unsatisfactory conditions

3.3 PREPARATION

A. Clean substrate, removing projections and substances detrimental to the work; comply with recommendations of manufacturer of products to be installed for proper preparation procedures. Mask off or protect adjacent surfaces not scheduled to receive sealer.

3.4 APPLICATION

A. Spray apply sealer to comply with manufacturer's instructions except where Project conditions require extra precautions or provisions to ensure satisfactory performance of the Work:
1. Apply sealer to produce surface without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or surface imperfections. Produce sharp glass lines and

color breaks.

3.5 CLEANING

A. After completing application, clean spattered surfaces. Remove spattered sealer by washing or other appropriate methods for coating. Do not scratch or damage adjacent finished surfaces.

B. Clean Up: Remove rubbish, empty cans, rags, and discarded materials from site daily. Rinse and recycle or legally dispose of sealer and coating containers.

3.6 PROTECTION

A. Institute protective procedures and install protective materials as required to ensure that work of this Section will be without damage or deterioration at substantial completion.

END OF SECTION 03 35 00

SECTION 03 53 00 CONCRETE TOPPING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Products for maintenance of concrete, including the following:
      a. Self-leveling concrete toppings.

B. Related Sections:
   1. Section 03 30 00: Cast-in-Place Concrete.

C. Reference Standards:
   1. ASTM International :
      a. ASTM C109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00: Submittal Procedures.

B. Product Data:
   1. Manufacturer's data sheets on each product to be used, including:
      a. Preparation instructions and recommendations.
      b. Storage and handling requirements and recommendations.
      c. Installation methods.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum five (5) years’ experience manufacturing similar products.

B. Installer Qualifications: Minimum two (2) years’ experience installing similar products.

C. Source Limitations: For repair products, obtain each color, grade, finish, type, and variety of product from single source and from single manufacturer with resources to provide products of consistent quality in appearance and physical properties.

D. Mock-Up:
   1. Provide a mock-up for evaluation of surface preparation techniques and application workmanship:
      a. Finish areas designated by Architect.
      b. Do not proceed with remaining work until workmanship is approved by Architect.
      c. Refinish mock-up area as required to produce acceptable work.

E. Pre-Installation Meetings:
   1. Convene minimum two (2) weeks prior to starting work of this Section.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handling: Handle materials to avoid damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: MAPEI Americas; 1144 E. Newport Center Dr., Deerfield Beach, FL 33442; Toll Free for Technical Services - CRS: Tel. 888-365-0614; Email: mpineda@mapei.com; Web: www.mapei.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00: Product Requirements.

C. Substitutions: Not permitted.

D. Product Performance:
   1. Compressive strength at 73 degrees F (23 degrees C) and 50 percent relative humidity (ASTM C109):
      a. 1 day: > 2,500 psi (17,2 MPa).
      b. 7 days: > 4,400 psi (30,3 MPa).
      c. 28 days: > 6,100 psi (42,1 MPa).
   2. Flexural Strength (ASTM C348):
      a. 1 day: > 650 psi (4,48 MPa).
      b. 7 days: > 1,280 psi (8,83 MPa).
      c. 28 days: > 1,400 psi (9,66 MPa).

2.2 SELF-LEVELING CONCRETE TOPPINGS

A. Self-Leveling, Self-Drying, Polishable, Concrete Topping:
   1. Packaged, dry mix for repair of concrete, and containing a latex additive as either a dry powder or a separate liquid added during mixing.
      a. Product: Subject to compliance with requirements, provide MAPEI Corporation Ultratop.
      b. Product shall be non-redispersible.
      c. Compressive strength: Not less than 6,000 psi (42 MPa) within 28 days when tested according to ASTM C109/C109M.

2.3 MISCELLANEOUS MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I, II, or III unless otherwise indicated.

B. Water: Potable.

2.4 MIXES

A. General:
   1. Mix products in clean containers according to manufacturer's written instructions.
   2. Do not add water, thinners, or additives unless recommended by manufacturer.
   3. When practical, use manufacturer's premeasured packages to ensure that materials

are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.

4. Do not mix more materials than can be used within time limits recommended by manufacturer. Discard materials that have begun to set.

B. Concrete: Comply with Section 03 30 00: Cast-in-Place Concrete.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

3.2 SEQUENCING

A. Ensure that products of this Section are supplied to affected trades in time to prevent interruption of construction progress.

3.3 EXAMINATION

A. Properly prepared concrete at least 28 days old, stable, sound, and dry.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.4 PREPARATION

A. Concrete surface must be free of loose particles, efflorescence, paints, tars, grease, asphaltic materials, bond breakers, curing compounds, wax, and dry foreign substances or any conditions that may affect product performance or proper bonding.

B. Mechanically profile and prepare concrete surfaces by engineer-approved methods in accordance with the most current ICRI 310.2R Guidelines.

C. Always use caulking or foam tape to round off any sharp corners that protrude into the room receiving the topping, as well as column bases, supports, and equipment pedestals, etc.; include the use of foam tape around the perimeter of the pour.

D. Ensure that the concrete surface is saturated surface-dry (SSD) before the installation of Planitop® 11. Alternatively, the prepared concrete can be coated with Planibond® 3C.

E. Before the application of Ultratop®, always properly prepare the surface and prime it with MAPEI’s Primer SN sand broadcast method. Refer to TDS’s for details.

3.5 MIXING

A. Choose all appropriate safety equipment before use. Refer to the Safety Data Sheet for information

B. The mixing ratio is 4.75 to five (5) quarts (4.5 to 4.73 L) of clean, potable water per 50-

pound (22,7 kg) bag of Ultratop®.

C. Place 3/4 of the required amount of cool, clean, potable water into a clean mixing container. Slowly add Ultratop® powder while mixing and always add the powder to the water.

D. While mixing, add the remaining water to achieve a smooth, homogenous, and lump-free mix. Do not add more water than specified.

E. Use of Integral Colors:
   1. Integral colors may be used at the discretion of the Owner/installer. However, extreme caution must be exercised to ensure that the type and amount of color does not alter and/or decrease the performance of Ultratop®. A test pour should be conducted that performance characteristics – such as set time, flow, water ratio, ease of finishing, and curing – are not significantly altered.

3.6 INSTALLATION

A. Read all installation instructions thoroughly before installation.

B. Before installation, close all doors and windows and turn off HVAC systems to prevent drafts. Protect areas from direct sunlight.

C. Make sure that the substrate and ambient room temperatures are between 50 degrees F and 90 degrees F (10 degrees C and 32 degrees C) before application. Refer to ACI cold-weather application guidelines in cool conditions, and refer to ACI hot-weather application guidelines for temperatures above 85 degrees F (29 degrees C).

D. Ultratop® has an approximate flow time of 15 minutes at 73 degrees F (23 degrees C), is self-leveling, and can be applied from 1/4-inch to two-inch (6mm to 5cm) neat. Note that temperature and humidity will affect the working time, flowability, and setting time.

E. Maintain a continuous flow of wet material to maximize the working/finishing time and achieve a uniform finish throughout. Consider mixing two (2) bags at a time and work as a team for best results.

F. Application of Ultratop® over large areas can be made easier and more efficient by using conventional piston, rotor-stator, or underlayment-type pumps. Contact MAPEI's Technical Services Department for recommendations.

G. Set the width of the pour at a distance that is ideal for maintaining a wet edge throughout placement. Quickly pour or pump Ultratop® onto the properly prepared and primed surface in a ribbon pattern. If a wet edge cannot be maintained, reduce the width of the pour.

H. Immediately after placing Ultratop®, spread the material with a gauge rake. After achieving the desired depth, use a smoother to obtain an even surface. To avoid air entrapment, do not overwork the material.

I. Ultratop® quickly hardens within two (2) to three (3) hours and is ready to accept stains, water-based coatings, or sealers within 24 hours. Sealers and coatings protect surfaces from contaminants and soiling, optimizing the surface integrity and aesthetics.

J. Ultratop® is a decorative topping material and can be polished. Refer to MAPEI's Technical Bulletin 010611-TB for guidelines.

3.7 CURING AND PROTECTION

A. Ultratop® is self-curing; do not use a damp-curing method or curing-and-sealing compounds.

B. Protect from traffic, dirt, and dust from other trades until the final floor, sealer, or coating has been installed and completely cured.

C. Do not expose Ultratop® to rolling loads, such as forklifts or scissor lifts, for at least 48 hours of installation.

END OF SECTION 03 53 00

SECTION 06 10 00 ROUGH CARPENTRY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes rough carpentry, light hardware, and miscellaneous items of work not included in another Section. This Section also includes:
   1. Structural wood supports, grounds, backing, and blocking required for wood framed structures including but not limited to flooring, wall, roof and ceiling construction.
   2. Backing/blocking for millwork and casework items that are an integral part of wall, floor, and/or ceiling construction.
   3. Backing/Blocking for Mechanical-Plumbing-Electrical work and equipment.
   4. Plywood sheathing.

B. Related Sections:
   1. Section 03 10 00: Concrete Forming and Accessories.
   2. Section 03 30 00: Cast-In-Place Concrete.
   3. Section 07 92 00: Joint Sealants.
   4. Section 09 21 16: Gypsum Board Assemblies.
   5. Section 10 28 13: Toilet Accessories.

C. Reference Standards:
   1. The following references, codes, and standards are hereby made a part of this Section and carpentry work shall conform to applicable requirements therein except as otherwise specified herein or shown on the Drawings. Nothing contained in the Drawings or these Specifications shall be construed as permitting work that is contrary to code requirements:
      a. Standard Grading and Dressing Rule #16, of the West Coast Lumber Inspection Bureau.
      b. Grading Rules for Western Lumber of the Western Wood Products Association.
      c. Standard Specifications for Grades of California Redwood Lumber of the Redwood Inspection Service.
      d. American Wood Preservers Association (AWPA) Standard C 2-77 Lumber, Timbers, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes.
      e. American Wood Preservers Bureau (AWPB) Quality Control Standards.

1.3 QUALITY ASSURANCE

A. Lumber and plywood shall be grade or quality marked by WWPA, WCLIB, APA, AWPB, or by other grading and inspection agencies acceptable to the Architect. Grade marks shall include the designation "S-DRY"(or "MC-15" as applies) where applicable. Grade and quality marks shall not be apparent on surfaces exposed in the finished work.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store kiln dried materials in enclosed areas, protected from moisture and separated from contact with concrete or soil.

PART 2 PRODUCTS

2.1 MATERIALS

A. Temporary Construction: Clean lumber at Contractor's option, rough or smooth, as usage requires.

B. Lumber Not Otherwise Specified or Noted:
   1. Douglas fir or larch, graded and grade-marked, according to Reference Standard 1.02 A or B, #1 grade:
      a. Boards: Construction grade.

C. Sill Plates (On Concrete): #2 grade lumber, pressure treated as hereinafter specified; as noted on Plans.

D. Plywood for Walls and Roofs; As Noted On Plans:
   1. Unless glue type is otherwise specified, exterior plywood, interior plywood exposed to continuing moisture, and pressure treated plywood shall be fabricated with exterior glue. Plywood with interior glue shall be fully protected from soaking or continuing moisture at all times.

E. Rough Hardware:
   1. Nails, spikes, bolts, screws, tacks, and framing connectors of standard manufacture as required. Hot dip galvanize items exposed to moisture or to exterior and those items that are in contact with wood pressure treated with waterborne salts:
      a. Bolts and nuts: ASTM A307, Grade A.
      b. Lag bolts: Fed. Spec. FF-B-561. Pre-drill per CBC.
      c. Nails: Fed. Spec. FF-N-101, common unless otherwise noted or specified.
      d. Joist hangers and framing connectors: Simpson or approved equal, unless otherwise noted.
      e. Power driven fasteners: Hilti, Ramset, or approved equal, each use and fastener type subject to prior approval of Architect.

F. Pressure Treatment (Decay and Termite Prevention):
   1. Pressure treat for decay and termite prevention, Douglas fir or larch wood materials that are embedded in or set against concrete.
   2. Treat in accordance with Reference Standard 1.02 E and quality mark as per Reference Standard 1.02 F.
   3. Treat with any of the following processes at Contractor option. Creosote type preservatives are not permitted:
      a. Penta in an LPG carrier (Cellon) or Penta in Hydrocarbon Solvent-Type D (Dow Process) AWPB LP-4 quality marked.
      b. Ammoniacal copper arsenate (ACA) or chromated copper arsenate (CCA) in a water carrier (AWPB LP-2 quality marked).
      c. Disodium Octaborate Tetrahydrate (DOT) such as Advance Guard/Hi-bor by Osmose, Inc.
      d. Members treated with waterborne salts shall be dried to a moisture content not exceeding 19 percent after treatment.
   4. Where possible, precut material before treatment.
   5. Holes and cutoffs and handling and storage shall be in accordance with AWPA M-4.
   6. Ensure that ferrous metal fastenings and items in contact with wood treated with waterborne salts are hot dip galvanized (1.25 oz. coating) where required by ICC reports.

G. Building Paper and Felt: Kraft waterproof building paper or 15# unperforated asphalt saturated rag felt per CBC Standard 14-1.

H. Framing Connectors: Simpson Strong Tie Corp., or equal.

2.2 MOISTURE CONTENT

A. Moisture content of sawn lumber shall not exceed 19% when framing starts or sheathing is applied.

B. Moisture content of glulam members shall not exceed 12%.

2.3 SIZES

A. Surfaced to "DRY" sizes. Sizes noted are nominal unless shown as net.

2.4 SURFACING

A. All wood materials exposed in the finished work shall have re-sawn surfaces of clean natural color unless noted or specified otherwise. Concealed framing lumber shall be S4S.

PART 3 EXECUTION

3.1 ERECTION AND INSTALLATION

A. Framing: Conform to CBC where same covers points not indicated on Drawings. Properly lay out framing with pieces closely fitted, accurately plumbed, leveled and aligned, and rigidly secured in place.

B. Except as specifically shown on structural drawings, cutting of all wood, etc. is limited to those cuts permitted by 2022 California Building Code (CBC).

C. Bridging and Blocking: Conform to CBC. Provide two times blocking at intersections of finished surfaces for adequate bearing and at points where required to support fixtures, cabinets, hardware, and other equipment mounted on walls.

D. Plywood (General): Unless more stringent requirements are indicated on the Drawings or required by code, application of plywood shall be in accordance with recommendations of the American Plywood Association.

E. Connections and Fastenings: Conform to CBC. Unless otherwise specified or shown on the Drawings, conform to minimum nailing requirements of CBC. For bolted connections, provide washers under heads and nuts bearing on wood, and draw nuts tight. Retighten before closing in framing. Exercise care in nailing through exposed sheathing and siding and ensure that fasteners penetrate into framing members

END OF SECTION 06 10 00

SECTION 06 10 53 MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Framing with dimension lumber.
   2. Rooftop equipment bases and support curbs.
   3. Wood blocking, cants, and nailers.
   4. Wood furring and grounds.
   5. Wood sleepers and platform wood flooring.
   6. Plywood backing panels.
   7. Accessories necessary for a complete installation.

1.3 DEFINITIONS

A. Boards or Strips: Lumber of less than two inches (2”) nominal (38 mm actual) size in least dimension.

B. Dimension Lumber: Lumber of two inches (2”) nominal (38 mm actual) or greater size but less than five inches (5”) nominal (114 mm actual) size in least dimension.

1.4 SUBMITTALS

A. Product Data:
   1. Submit each type of process and factory fabricated product. Indicate component and materials and dimensions and include construction and application details:
      a. Wood treatment:
         1) Submit data for wood preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained:
            a) Include data for fire retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by qualified independent testing agency.
            b) For fire retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
            c) For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to site.

B. Laboratory and Testing Reports:
   1. Laboratory test reports:
      a. Submit report for installation adhesives indicating compliance with requirements for low emitting materials.

b. Post installed anchors.
c. Metal framing anchors.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Building code: Comply with applicable requirements of CBC Chapter 23 for miscellaneous wood.
2. Fire retardant treated lumber and plywood by pressure process: Provide products with a flame spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
3. Level floor finishes to minimum requirement noted CBC Section 11B-302.1.

B. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 PRODUCTS

2.1 WOOD PRODUCTS

A. Lumber:
1. DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated:
a. Factory mark each piece of lumber with grade stamp of grading agency.
b. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
c. Dress lumber, S4S, unless otherwise indicated.
d. Maximum moisture content of lumber: 19 percent unless otherwise indicated.

B. Preservative Treatment by Pressure Process:
1. AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground:
a. Preservative chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
b. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
c. Kiln dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
d. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

e. Application - treat items indicated on Drawings and the following:
   1) Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   2) Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

C. Fire Retardant Treatment:
   1. Where indicated as fire retardant treated, provide materials acceptable to authorities having jurisdiction, and with fire test response characteristics specified as determined by testing identical products per ASTM E84 by a qualified testing agency:
      a. Treatment shall not promote corrosion of metal fasteners.
      b. Exterior type: Comply with specified requirements for fire retardant treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
      c. Interior Type A: Provide treated materials with moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
      d. Design value adjustment factors:
         1) Test treated lumber according to ASTM D5664 and calculate design value adjustment factors according to ASTM D6841:
            a) For enclosed roof framing, framing in attic spaces, and where high temperature fire retardant treatment is indicated, provide material with adjustment factors of minimum 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for climatological zone.
      e. Kiln dry lumber after treatment to a maximum moisture content of 19 percent.
      f. Identify fire retardant treated wood with appropriate classification marking of qualified testing agency:
         1) For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
      g. For exposed items indicated to receive a stained or natural finish, verify chemical formulations shall not bleed through, contain colorants, or adversely affect finishes.
      h. Application:
         1) Treat items indicated on Drawings and the following:
            a) Framing for raised platforms.
            b) Concealed blocking.
            c) Roof framing and blocking.
            d) Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
            e) Plywood backing panels.
            f) Wood platform deck flooring.

D. Dimension Lumber Framing:
   1. Non load bearing interior partitions: Construction or No. 2 grade of any species.
   2. Other framing: Construction or No. 2 grade of any species.

E. Miscellaneous:
   1. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including but not limited to blocking, nailers, cants, grounds, furring, roof top equipment bases and support curbs, and utility shelving:
      a. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
      b. For blocking not used for attachment of other construction, use utility, stud, or No. 3 grade lumber of any species provided that it is cut and selected to eliminate defects that interfere with attachment and purpose.
      c. For blocking and nailers used for attachment of other construction, select and cut

lumber to eliminate knots and other defects that interfere with attachment of work.
d. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.
e. Utility shelving:
1) Lumber with 19 percent maximum moisture content of any of the following species and grades:
a) Eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; Premium or No. 2 Common (Sterling) grade; NeLMA, NLGA, WCLIB, or WWPA.
b) Mixed southern pine or southern pine No. 2 grade; SPIB.
c) Spruce-pine-fir (south) or spruce-pine-fir, Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.

F. Concealed Boards:
1. 19 percent maximum moisture content of any of the following species and grades:
a. Mixed southern pine or southern pine, No. 2 grade; SPIB.
b. Spruce-pine-fir (south) or spruce-pine-fir, Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
c. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
d. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
e. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

G. Plywood Backing Panels (Sleepers):
1. Equipment backing panels: Plywood, DOC PS 1, Exterior, C-C Plugged or Exposure 1, C-D Plugged, fire retardant treated, in thickness not less than 3/4-inch (19 mm) nominal thickness.

H. Fasteners:
1. Provide fasteners of size and type indicated that comply with requirements:
a. Where carpentry is exposed to weather, in ground contact, pressure preservative treated, or in area of high relative humidity, provide fasteners with hot dip zinc coating complying with ASTM A153/A153M.
b. Nails, brads, and staples: ASTM F1667.
c. Screws for fastening to metal framing: ASTM C1002 drywall type or ASTM C954 nonload bearing steel stud, length recommended by screw manufacturer for material being fastened.
d. Power driven fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70. (Refer to Structural Drawings)
e. Post installed anchors: (Refer to Structural Drawings)
1) Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 mechanical, masonry, ICC-ES AC58 mechanical, concrete, ICC-ES AC193 adhesive, masonry, or ICC-ES AC308 adhesive, concrete as appropriate for the substrate:
a) Material, interior: Carbon steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.
b) Material, exterior: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2.

I. Metal Framing Anchors:
1. Manufacturers are subject to compliance with requirements; provide products by one of

the following:
a. Cleveland Steel Specialty Co.
b. KC Metals Products, Inc.
c. Phoenix Metal Products, Inc.
d. Simpson Strong-Tie Co., Inc.

2. Galvanized steel sheet: Hot dip, zinc coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation. Use for interior locations unless otherwise indicated.
3. Hot dip, heavy galvanized steel sheet - ASTM A653/A653M; structural steel (SS), high strength low alloy steel Type A (HSLAS Type A), or high strength low alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick. Use for wood preservative-treated lumber and where indicated:
   a. Stainless steel sheet: ASTM A666, Type 304 and Type 316 for exposed application in coastal environments. Use for exterior locations and where indicated.

J. Miscellaneous Materials:
1. Adhesives for gluing to concrete or masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.
2. Flexible flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized asphalt compound, bonded to high density polyethylene film, aluminum foil, or spunbonded polyolefin to produce overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 EXECUTION

3.1 INSTALLATION

A. Framing Standard: Comply with AF&PA WCD 1 Details for Conventional Wood Frame Construction unless otherwise indicated.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels:
1. Install fire retardant treated plywood backing panels with classification marking of testing agency exposed to view.

D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Do not splice structural members between supports unless otherwise indicated.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim:
1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

G. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2,438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and two-inch nominal (2") (38-mm actual) thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 square feet (9.3 sq. m) and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.

H. Sort and select lumber so natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative treated lumber:
1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

J. Where wood preservative treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

K. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. Table 2304.9.1 Fastening Schedule in the International Building Code.
2. ICC-ES evaluation report for fastener.

L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

M. Wood Blocking and Nailer Installation:
1. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved:
   a. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
   b. Provide permanent grounds of dressed, pressure preservative treated, key beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.2 SITE ENVIRONMENTAL PROCEDURES

A. Indoor Air Quality: Provide temporary ventilation during work. During and immediately after installation of treated wood, engineered wood products, and laminated wood products at interior spaces, provide temporary ventilation.

B. Waste Management:
1. Refer to Section 01 74 19: Construction Waste Management and Disposal, and Construction Waste Management Plan:
   a. Select lumber sizes to minimize waste; reuse scrap lumber to the greatest extent

possible. Clearly separate scrap lumber for use onsite as accessory components, including shims, bracing, and blocking.

b. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
c. Prevent sawdust and wood shavings from entering the storm drainage system.
d. Do not burn scrap lumber that has been pressure treated.
e. Do not send lumber treated with pentachlorophenol, CCA, or ACA to cogeneration facilities or waste to energy facilities.

3.3 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron treated wood becomes wet, apply EPA registered borate treatment. Apply borate solution by spraying to comply with EPA registered label.

B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA registered borate treatment. Apply borate solution by spraying to comply with EPA registered label.

END OF SECTION 06 10 53

SECTION 06 16 00 SHEATHING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Wall sheathing.
   2. Underlayment.
   3. Sheathing joint and penetration treatment.
   4. Accessories necessary for a complete installation.

1.3 SUBMITTALS

A. Product Data:
   1. Technical data for each type of process and factory fabricated product. Indicate component materials and dimensions and include construction and application details:
      a. Include data for wood preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
      b. Include data for fire retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
      c. For fire retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5516.
      d. For products receiving a waterborne treatment, include statement that moisture content of treated materials reduced to levels specified before shipment to Project site.
      e. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 QUALITY ASSURANCE

A. Fire Test Response Characteristics:
   1. For assemblies with fire resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E119 by a testing and inspecting agency acceptable to authorities having jurisdiction:
      a. Fire resistance ratings: Indicated by design designations from UL Fire Resistance Directory or GA-600 Fire Resistance Design Manual.

B. Testing Agency Qualifications: For testing agency providing classification marking for fire retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 PRODUCTS

2.1 MATERIALS

A. Plywood: DOC PS 1.

B. Oriented Strand Board: DOC PS 2.

C. Thickness: As necessary to comply with requirements specified, but not less than thickness indicated.

D. Factory mark panels to indicate compliance with applicable standard.

2.2 FIRE RETARDANT TREATED PLYWOOD

A. Where fire retardant treated materials are indicated, use materials complying with requirements acceptable to authorities having jurisdiction and with fire test response characteristics specified determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire Retardant Treated Plywood by Pressure Process:
   1. Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test:
      a. Use treatment that does not promote corrosion of metal fasteners.
      b. Exterior type: Treated materials shall comply with requirements specified above for fire retardant treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated
      c. Design value ac NOT USED nber plywood shall be tested according to AS adjustment factors shall be calculated according to ASTM D6305. Span ratings after treatment shall be not less than span ratings specified. For roof sheathing and where high temperature fire retardant treatment is indicated, span ratings for temperatures up to 170 degrees F (76 degrees C) shall be not less than span ratings specified.

C. Kiln dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire retardant treated plywood with appropriate classification marking of qualified testing agency.

E. Application:
   1. Treat plywood indicated on Drawings and the following:
      a. Roof and wall sheathing within 48 inches (1,220 mm) of fire walls.
      b. Subflooring and underlayment for raised platforms.

2.3 WALL SHEATHING

A. Glass Mat Gypsum Wall Sheathing - ASTM C1177/C1177M:

1. Product is subject to compliance with requirements; provide products by one of the following:
   a. CertainTeed Corporation: GlasRoc (basis of design).
   b. Georgia Pacific: Dens-Glass.
   c. National Gypsum Company: Gold Bond eXP.
   d. United States Gypsum Co.: Securock.
2. Type and thickness: Regular, 1/2 inch (12.7 mm) thick.
3. Size: Four feet by eight feet (1,220 mm by 2,440 mm) for vertical installation.

2.4 SUBFLOORING AND UNDERLAYMENT

A. Plywood Combination Subfloor Underlayment - DOC PS 1, Exterior, Structural I, C-C Plugged Single Floor Panels:
   1. Span rating: Not less than 20 o.c.
   2. Nominal thickness: Not less than one inch (25 mm).
   3. Edge detail: Tongue and groove.
   4. Surface finish: Fully sanded face.

B. Underlayment: Provide underlayment in nominal thickness not less than 1/4 inch (6.4 mm) over smooth subfloors and not less than 3/8 inch (9.5 mm) over board or uneven subfloors.

C. Sound Deadening Board - Class C Fire Rated, Molded, Recycled Post-Consumer Paper, Cellulose Fiber Structural Panel:
   1. Density: 26 pcf to 28 pcf (416 = 448 kg/cu.m) tested in accordance with ASTM C209.
   2. Tensile strength - when tested in accordance with ASTM C209:
      a. Parallel: 450 - 700 psi (3,100 - 4,830 kPa).
      b. Transverse: 750 - 1--- psi (5.1171 - 6.894 kPa).
   3. Hardness (Janka Ball): 230 pounds (104 kg) tested in accordance with ASTM D1037.
   4. Water absorption by volume, when tested in accordance with ASTMC209:
      a. Two-hour immersion: Maximum seven percent (7%).
   5. Expansion: 50 percent to 90 percent relative humidity, 0.25 percent in accordance with ASTM C209.
   6. Noise reduction coefficient (NCR): 0.20.
   7. Flame spread: Maximum 75 tested in accordance with ASTM E84 Class C.
   8. Thickness: 3/4 inch (19 mm).

2.5 FASTENERS

A. Provide fasteners of size and type indicated that comply with requirements specified for material and manufacture. Provide fasteners with hot dip zinc coating complying with ASTM A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening Gypsum Sheathing to Cold Formed Metal Framing:
   1. Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic polymer or corrosion protective coating having salt spray resistance of more than 800 hours according to ASTM B117:
      a. For steel framing less than 0.0329 inch (0.835 mm) thick, use screws that comply with ASTM C1002.

2.6 SHEATHING JOINT AND PENETRATION TREATMENT MATERIALS

A. Sealant for Glass Mat Gypsum Sheathing:
   1. Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass fiber sheathing tape and for covering exposed fasteners:
      a. Sheathing tape: Self-adhering glass fiber tape, minimum two inches (50 mm) wide, ten by ten or ten by 20 threads/inch (390 by 390 or 390 by 780 threads/m) of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass mat gypsum sheathing and with history of successful in-service use.

2.7 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

B. Dry-Rot Repair: For existing Wood Frame Studs, Glue-Lam Beams and Plywood Sheathing.
   1. Use Clear Penetrating Epoxy Sealer Products – Field applied
   2. Do NOT thin any product used unless the manufacturer suggest. Follow instructions.
   3. Replace with new frame and sheathing where damage exceeds 15% or as inspected and recommended.
   4. Replace ALL structural members where dry-rot is present.

PART 3 EXECUTION

3.1 INSTALLATION

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three (3) support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated.

D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate wall and roof sheathing installation with flashing and joint sealant installation so materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions. Fasten gypsum sheathing to cold formed metal framing with screws. Install boards with a 3/8-inch (9.5 mm) gap where non-load bearing construction abuts structural elements. Install boards with a 1/4-inch (6.4 mm) gap where they abut masonry or similar materials that retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Vertical Installation:
   1. Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud:
      a. Space fasteners approximately eight inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.

D. Seal sheathing joints according to sheathing manufacturer's written instructions. Apply glass fiber sheathing tape to glass mat gypsum sheathing joints and apply and trowel silicone emulsion sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal penetrations and openings.

END OF SECTION 06 16 00

SECTION 06 20 00 FINISH CARPENTRY AND MILLWORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Providing all finish carpentry items including, but not limited to:
      a. Finish carpentry.
      b. Millwork and cabinetry.
      c. Solid Surface Countertop.
      d. Plastic laminate.
      e. Casework hardware.
      f. Miscellaneous millwork.
   2. Installation of:
      a. Finish hardware.
      b. Plastic laminate faced wood doors.

B. Related Sections:
   1. Section 06 10 00: Rough Carpentry.
   2. Section 08 71 00: Door Hardware.
   3. Section 09 21 16: Gypsum Board Assemblies.
   4. Section 13 34 23: Pre-Engineered Modular Buildings.

C. Reference Standards:
   1. Codes and references:
      a. 2022 California Building Code Section 11B-309.
      b. American Disabilities Act Design Guidelines (ADADG).
   2. American National Standards Institute:
      a. ANSI A156.9 Cabinet Hardware.
      b. ANSI A161.1 Woodwork Testing Standards.
      c. ANSI A208.1 Mat-Formed Wood Particleboard.
   3. Woodwork Institute:
      a. WI North American Architectural Woodwork Standards (current edition).
   4. National Electrical Manufacturers Association:
      a. NEMA LD 3 High Pressure Decorative Laminates.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer's specifications and other data needed to prove compliance with specified requirements.
   2. Manufacturer’s preprinted product information for all hardware proposed on the Project.
   3. Manufacturer’s preprinted maintenance instructions for the casework hardware.

B. Shop Drawings:
   1. Indicate size, material, and finish.
   2. Show locations and installation procedures, including hardware, sinks, service fixtures,

trim, and other pertinent data for each unit.

C. Certification: Provide manufacturer's certification that casework has been fabricated and installed according to WI "Custom" Grade guidelines or better.

D. Samples: Two (2) each, six-inch by six-inch by ¾-inch (6" x 6" x 3/4") sample of specified particleboard core with grade stamp for use as verification of installed product.

E. Closeout:
1. Record drawings: Indicate revisions to original Drawings and shop drawings.
2. Manufacturer contact names, addresses, and phone numbers.
3. Finish material schedule: Names and color numbers of laminates and stains.
4. Keys: Provide additional master key for each room and additional locksets totaling one percent (1%) of total Project for attic stock.

1.4 PERFORMANCE REQUIREMENTS

A. Unless otherwise indicated, perform work in accordance with WI "Architectural Woodwork Standards," Custom Grade, except where specification exceeds those standards the more stringent shall govern.

B. Fabricate millwork and cabinetry in accordance with ANSI A161.1, NEMA LD3, and general static load testing performed and certified by an independent testing agency covering the following areas of product performance, with these minimum results:
1. Base cabinet construction/racking test: 800 pounds.
2. Cabinet front joint loading test: 425 pounds.
3. Wall cabinet static load test: 2,000 pounds.
4. Drawer front joint loading test: 600 pounds.
5. Drawer construction/static load test: 750pounds.
6. Cabinet adjustable shelf support device/static load test: 300 pounds.

C. Shelf Loading: Comply with loading/deflection standards of the Composite Panel Association.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a licensee of WI's Certified Compliance Program.

B. Installer Qualifications: Licensee of WI's Certified Compliance Program.

C. Quality Standard:
1. Unless otherwise indicated, comply with WI's "Manual of Millwork" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements:
   a. Before delivery to jobsite, millwork supplier:
      1) Licensees of WI shall issue a certified compliance certificate indicating millwork products being furnished for this Project, and certifying that these products and their installation, will fully meet requirements of grade or grades specified.
      2) Non-licensees of WI shall provide evidence that they have arranged for inspection by WI inspector after completion of fabrication and installation. If conditions are found to be compliant, inspector will issue Compliance Certificate indicating millwork products being furnished for this Project and

certifying that these products and their installation will fully meet requirements of grade or grades specified.

b. Each elevation of casework and each countertop shall bear certified compliance label.
c. Cabinet Design Series (CDS): CDS numbers on Drawings indicate typical designs.

D. Certified Seismic Installation Program (CSIP):
1. Before wood or metal stud walls are closed up, provide a written Woodwork Institute CSIP report confirming that acceptable backing is provided in all locations required for casework installation or identifying those locations where backing is missing or improperly located:
   a. Backing shall consist of a minimum of either three by six (3 x 6) flat Douglas Fir or 16-gage 50 KSI sheet metal.
2. On completion of installation, provide a Woodwork Institute CSIP Certificate identifying the work covered and certifying that installation meets the requirements of the WI CSIP attachment details and schedules.
3. All fees charged by the Woodwork Institute for their CSIP are the responsibility of the millwork installer and shall be included in their bid.

E. Pre-Installation Conference:
1. See Section 01 31 00: Project Management and Coordination.

1.6 WARRANTY

A. Warranty the work specified herein for five (5) years against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials and workmanship.

B. Defects shall include but not be limited to the following:
1. Rough or difficult operation, or loose or missing parts.
2. Delamination of surfaces.
3. Noticeable deterioration of finish.
4. Warped or misaligned surfaces or telegraphing of subsurface imperfections.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver completed laminate clad casework, countertops, and related products only after wet operations in building are completed. Store in ventilated place, protected from the weather, with relative humidity range of 20 to 50 percent.

B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

PART 2 PRODUCTS

2.1 MILLWORK MANUFACTURERS

A. Woodwork Institute listed Accredited Millwork Companies, current roster and shall not preclude Contractor from using other manufacturers, provided they produce equivalent products of the type specified for the scope and size of the Project. Other manufacturers must have experience manufacturing products meeting or exceeding the specifications and must comply with the criteria performance set by the Woodwork Institute or as indicated in Part 1 of this Section and with Division 01 requirements regarding substitutions.

2.2 MILLWORK MATERIALS

A. Plastic Laminate:
1. High-pressure decorative laminate complying with NEMA LD3, and the following requirements:
   a. Exterior color selection available:
      1) Architect to select from minimum of 250 selections available, including wood grain patterns and solid colors.
      2) Provide five (5) different colors available per project.
      3) If laminate has wood grain, direction of grain shall be vertical on door, end panels, fascia panels, and exposed backs; horizontal on drawer faces, aprons, and top rails.
2. Laminate grades:
   a. Exposed doors, finished end panels, and other vertical surfaces: GP28 (0.028 inch thick nominal)
   b. Horizontal surfaces other than top: GP28 (0.028 inch thick nominal)
   c. Cabinet liner: CL20 (0.020-inch nominal), white.
   d. Work surfaces and countertops: GP50 (0.050-inch thick nominal) with BK20 (0.20-inch thick) backer sheet.
   e. Backsplash: PH42 (0.042 inch nominal) with nominally balanced backer sheet.
3. Adhesive: PVA water resistant adhesive. Contact adhesives not permitted.
4. Pressure fused laminate:
   a. NEMA LD3 VGL, and NEMA LD3 CLS, melamine resin impregnated, 120-gram PSM minimum, thermofused to core under pressure.
   b. Color:
      1) Closed interiors, underside of wall cabinets: White.
      2) Exposed and semi-exposed open cabinets: Match exterior.
   c. Provide balanced construction with same thermofused melamine. Unsurfaced coreboard or simple backers not allowed.

B. Core Material:
1. Particleboard: ANSI 208.1, Grade M-2-Exterior Glue.
2. Medium-density fiberboard: ANSI A208.2, Grade MD.
3. Plywood: Shop sanded, exterior grade veneer cored, hardwood faced, any species, with no defects affecting strength or utility. Overlay plywood not permitted. Plywood allowed at countertops and toe-base only.
4. Water resistant treated plywood shall have 24-hour thickness swell factor of five percent (5%) or less and 24-hour water absorption factor of ten percent (10%) or less; P.S. 51, Type II or better.
5. Cabinet components shall be of the following minimum core thicknesses:
   a. Cabinet backs, drawer body, and drawer bottoms: ½-inch particleboard.
   b. Door and drawer face, base, wall, and tall cabinet tops and bottoms, cabinet sides, drawer spreaders, cabinet back rear hangstrips, structural dividers, and exposed cabinet backs: 3/4-inch particleboard.
   c. Work surfaces and countertops: Minimum one-inch (1”) particleboard or plywood, except use water resistant treated plywood core at counters with sinks.
   d. Shelves: 3/4-inch particleboard core for 30 inches long or less, one-inch (1”) thick particleboard core for more than 30 inches long; 14-inch deep, unless otherwise noted. Provide vertical dividers for shelves over 36 inches long.
   e. Cabinet toe-base: 3/4-inch plywood. No particleboard within four inches (4”) of floor.

C. Countertops - WI Premium Grade: Where indicated on Drawings.
1. Solid Surface:
   a. Solid surfacing material thickness: ¾-inch (19 mm).
   b. Backsplash to match countertops, min 4 inches unless otherwise indicated on

Drawings.
c. Colors, patterns, and finishes: Provide materials and products resulting in colors of solid surfacing material indicated on Drawings.

2. Quartz countertops:
   a. Seams:
      1) Fabricate countertops without seams to the extent possible. When seams are necessary, fabricate countertops in sections indicated for joining in field, with sealant filled seams 1/16-inch (1.5 mm) in width.
   b. Fittings: Drill countertops in shop for fittings and similar items.
   c. Fabricate with four-inch (4”) backsplashes. Sand minor scratches and stains with #400 then #600 sandpaper.
3. Fabrication:
   a. Fabricate tops in one piece, unless otherwise indicated. Comply with solid surfacing material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing:
      1) Fabricate tops with shop applied edges of materials and configuration indicated.
      2) Fabricate tops with loose backsplashes for field application.
   b. Drill holes in countertops for plumbing fittings and soap dispensers in shop.
4. Countertop construction tolerances:
   a. Variation from plumb: For vertical lines and surfaces, do not exceed 1/16 inch in 48 inches (1.5 mm in 1,200 mm).
   b. Variation from level: Do not exceed 1/8 inch in 96 inches (3 mm in 2,400 mm), 1/4-inch (6 mm) maximum.
   c. Variation in joint width: Do not vary joint thickness more than 1/4 of nominal joint width.
   d. Variation in plane at joints (lipping): Do not exceed 1/64-inch (0.4 mm) difference between planes of adjacent units.
   e. Variation in line of edge at joints (lipping): Do not exceed 1/64-inch (0.4-mm) difference between edges of adjacent units, where edge line continues across joint.

D. Countertops and Backsplashes:
1. Countertops: Where indicated on Drawings; provide countertops with rolled edges in as long as practical continuous lengths. Provide field glued splines at joints. No joints closer than 24 inches either side of sink cutout.
2. Backsplash: Integral to countertop, four inches (4”) high unless otherwise shown. Fabricate with single continuous sheet of laminate from front counter to top of splash with no joints from horizontal to vertical application. No joints shall occur at sink openings.
3. At exposed countertop end corners, provide one-inch (1”) radius, or similar safety treatment.

E. Toe Spaces: Leave toe spaces unfinished for installation of resilient base, unless otherwise shown.

F. End Panels and Filler Strips: Match adjacent case-piece.

G. Edging:
1. Provide the following in accordance with “Edging Locations:”
   a. Flat edge PVC: 0.020 inch. Solid, high-impact, purified, color-thru, acid resistant, machine-applied with hot melt adhesives.
   b. Three-millimeter (3 mm) PVC: Solid, high-impact, purified, color-thru, acid resistant, pre-lamination primed edging, machine-applied with hot melt adhesives, and machine profiled to 1/8-inch radius.
2. Edging locations:
   a. Cabinet body edge, including door/drawer front spacer rail: Flat edge PVC, color

matched to door/drawer face or as selected.
b. Forward edge of interior body components, interior dividers, shelf, and top edges of drawer body: Flat edge PVC to match cabinet interior surface color.
c. Door/drawer-front edging: Three-millimeter (3 mm) PVC, color matched to standard laminates.

2.3 CABINET HARDWARE

A. All hardware shall meet ANSI A156.9 and shall be subject to approval by the Architect. All keying shall match existing master key system and be approved by the Owner:
1. Acceptable manufacturers:
a. Blum
b. Hafele
c. Knape & Vogt.
d. Sugatsune
e. As specified herein, provide specified product, or Architect approved equal.

B. Hinges:
1. Heavy duty, five-knuckle 2-3/4-inch institutional type hinge shall meet ANSI/BHMA A156.9 Grade 1 requirements. Mill ground, hospital tip, Teflon coated tight pin feature with all edges eased. Hinge shall be full wrap around type of tempered steel 0.095 inch thick. Each hinge shall have minimum of nine (9) screws, #7, 5/8-inch FHMS to assure positive door attachment.
2. One (1) pair per door to 48 inches height. 1-1/2 pair over 48 inches in height. Hinge shall accommodate 13/16 thick laminated door and allow 270-degree swing.
3. Finish: US26D.

C. Pulls: Wire design, four inches (4”), satin chrome, US26D finish.

D. Sliding Door Hardware:
1. Frameless 1/4-inch glass sliding doors; double track rolling door assembly.
2. Framed 13/16-inch thick stile and rail sliding doors; top mounted track with dual roller hangers. Vertical adjustment for accurate alignment.

E. Drawer Slides:
1. Standard drawers: 3/4 extension, self-closing, white epoxy-coated, lever disconnect, positive in-stop/out-stop, nylon rollers, minimum 100-pound dynamic load rating at full extension.
2. File drawers: Full extension, three-part progressive opening slide, precision steel ball bearing, minimum 100-pound dynamic load rating at full extension, zinc plated or epoxy coated at manufacturer’s option.
3. Provide body mounted molded rails for hanging file system for legal or letter size as indicated by manufacturer’s model number. Cutting or machining of drawer body/face not permitted.
4. Paper storage drawers: Full extension, self-closing, white epoxy-coated, lever disconnect, positive in-stop/out-stop, nylon rollers, minimum 150-pound dynamic load rating at full extension.

F. Catches:
1. Provide opening resistance in compliance with the Americans with Disabilities Act:
a. Provide top-mounted magnetic catch for base and wall cabinet door.
b. Provide two (2) at each tall cabinet door. Catch housing shall be molded in White.

G. Adjustable Shelf Supports:
1. Dual-pin design with anti-tip-up shelf restraints for both ¾-inch and one-inch (1”) shelves.

2. Include keel to retard shelf slide-off, and slot for mechanical attachment of shelf to clip.
3. Load rating shall be minimum 300 pounds each support without failure.

H. Wardrobe Rod: 1-1/6-inch diameter plated steel rod, with captive sockets.

I. Coat Hooks: Single and double prong, wall mount - satin aluminum.

J. Locks: Five-disk tumbler cam-style with strike. Locks on cabinets in same room keyed alike. Provide two (2) keys per room where doors and drawers are scheduled to receive locks. Dull chrome finish. Lock core shall be removable with a control key, permitting Owner to change lock arrangements without tools.

2.4 SPECIALTY ITEMS

A. Grommets:
1. Approved Product/Manufacturer: Model No. EDP3 manufactured by Doug Mockett & Company, Inc. (basis of design), Manhattan Beach, CA; (800) 523-1269, or Architect approved equal.
2. Size: 2-1/2 inches diameter with “Flip-Top”™ tab in cap.
3. Colors: As selected by Architect from manufacturer’s available colors.
4. Number/location: Where electrical, telephone, and computer data wiring need to pass through tops whether shown or not.

B. Keyboard Drawers (at all knee spaces):
1. Approved product/manufacturer: No. SD-1 as manufactured by Knape & Vogt; or Architect approved equal.

C. Molded Personal Pencil Drawer: High-impact 100 Polystyrene with in-stop, out-stop, and self-closing features. Provide under top mounted 100-pound self-closing slides. Twelve (12) compartment drawer body, and slides, black. Provide where indicated on plans.

D. Mailbox Label Holder: Brass, card size 1/2-inch by 2-3/16 inches. Provide one (1) at each opening.

2.5 SOLID STOCK

A. Moisture Content: Percent of moisture in relation to over-dry weight shall be between eight percent (8%) and 13 percent at time of installation.

B. Natural Finish Hardwood:
1. Occasional knot permitted provided it is tight and smooth.
2. Grain pattern: Rift-cut.
3. Species: WI "Premium" Grade, white oak.

C. Paint Grade Hardwood: Any species, including Parana Pine, except do not use oak, elm, or similar species that have coarse grain.

2.6 MISCELLANEOUS

A. Utility Shelving: WI "Economy" grade.

B. Clothes Rod: 1-1/2 inch diameter smooth wooden dowel by length required, with end supports and fasteners of type recommended to suit application.

C. Telephone/MDF/IDF Board: Provide minimum four foot by eight foot by ¾-inch (4’ x 8’ x

3/4") thick plywood for telephone/data punch down blocks and video equipment in accordance with Section 06 10 00: Rough Carpentry. Paint in accordance with Section 09 90 00: Painting and Coating.

2.7 MILLWORK FABRICATION

A. Use the WI Custom Grade woodwork classification unless noted elsewhere complying with referenced quality standard.

B. Fabricate casework, countertops, and related products to dimensions, profiles, and details shown on Drawings. Fabricate casework square, plumb, and true.

C. Detailed Requirements for Cabinet Construction:
   1. Toe-base:
      a. Continuous, ladder type platform with concealed fastening to cabinet bottom, level and secured to floor.
      b. Toe-base at exposed cabinet end panels shall be recessed ¼-inch from face of finished end for flush installation of finished base material.
      c. No cabinet sides-to-floor will be allowed.
   2. Cabinet top and bottom:
      a. Solid sub-top shall be furnished for all base and tall cabinets.
      b. At cabinets over 36-inches, bottoms and tops shall be mechanically joined by a fixed divider.
      c. Assembly devices shall be concealed on bottom side of wall cabinets.
   3. Cabinet sides:
      a. Doweled, and glued under pressure, or attached with fully concealed interlocking mechanical fasteners to sub-top and bottom.
      b. Drill holes for adjustable shelves 1-1/4 inch on center.
   4. Cabinet backs:
      a. Side bound, captured in grooves, recessed from cabinet rear, and securely fastened at top and bottom.
      b. Hang rails shall be located at rear of cabinet back and fastened to cabinet sides. Provide minimum of two (2) at base, two (2) at wall, and three (3) at tall cabinets as instructed by casework manufacturer.
      c. Provide removable back panels and closure panels for plumbing access at all sink cabinets, and where shown on Drawings.
   5. Exposed end corner and face frame attachment:
      a. Butt joint, glued and finish nailed; or attached with fully concealed interlocked mechanical fasteners.
   6. Door and drawer fronts:
      a. Drawer fronts and hinged doors shall overlay the cabinet body. Maintain a maximum 1/8-inch reveal between pairs of doors, between door and drawer front, or between multiple drawer fronts within the cabinet.
      b. Where indicated, provide stile and rail doors with full 1/4-inch plate glass, hinged or sliding. Exposed lite-opening edges shall be trimmed and glazed with extruded glazing bead.
      c. Where indicated, frameless sliding glass doors shall be 1/4-inch thick plate glass with ground and polished edges. Fit with anodized aluminum shoes and nylon rollers.

D. Drawers:
   1. Drawer fronts: Apply to separate drawer body component sub-front.
   2. Drawer sides: Doweled to receive front and back, glued under pressure, machine squared.
   3. Drawer bottom: Set into front and sides, 1/4-inch deep groove with minimum 3/8-inch standing shoulder, continuously glued. Reinforce drawer bottoms with ½-inch by four-

inch (4") front-to-back intermediate underbody stiffeners, mechanically fastened. One (1) at 24 inches, two (2) at 36 inches, and over.
4. Paper storage drawers: Fitted with full width hood at back.
5. Hanging file drawers shall be fabricated to accept letter size hanging folders compatible with Pendaflex system.

E. Vertical and Horizontal Dividers: As required by manufacturer for type and style of component.

F. Door/Drawer Front Rail: As required by manufacturer for type and style of component, and hardware placement.

G. Accessibility Requirements - 2022 California Building Code, Section 11B:
1. The following special requirements shall be met, where specifically indicated on architectural Plans as "accessible" or by general note. Shall be in compliance with California title 24 access:
a. Countertop height: With or without cabinet below, not to exceed a height of 34 inches above finished floor (A.F.F.), at a surface depth of 24 inches.
b. Knee space clearance: Minimum 27 inches A.F.F. at apron, and 30 inches clear span width (11B-306.3).
c. Sink cabinet clearances: In addition to above, upper knee space frontal depth shall be no less than eight inches (8"), and lower toe frontal depth shall be no less than 11 inches, at a point nine inches (9") A.F.F., and as further described in 11B-306.

H. Typical Desk or Counter Height at Knee Space Locations: 30 inches A.F.F.

PART 3 EXECUTION

3.1 JOB CONDITIONS

A. Environmental Requirements:
1. Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least one (1) week:
a. Manufacturer/supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
b. After installation, control temperature and humidity to maintain relative humidity between 25 and 55 percent.

B. Conditions: Do not store or install casework in building until concrete, masonry, and drywall/plaster work is dry.

3.2 COORDINATION

A. Coordinate the work of this Section with plumbing work specified in Division 22. Coordinate sink opening construction with sinks specified in Division 22 or as indicated on Drawings.

B. Coordinate location of blocking in walls for installation and support of wall cabinets.

3.3 MILLWORK INSTALLATION

A. Positioning: Place approximately level, plumb, and at right angles to adjacent work.

B. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging the products and adjacent work.

C. Anchorage: Attach securely so the products will perform to their maximum ability without damage from inadequate fastenings.

D. Fasten tops to frames with concealed clips, screws, and glue.

E. Install simulated wood trim in locations shown on Drawings and in accordance with manufacturer's instructions.

3.4 EXISTING DOOR LAMINATE RESURFACING

A. Resurfacing procedures shall be in accordance with the recommendations and instructions of the laminate and adhesive manufacturers.

B. Acclimate laminate to the same environment as existing material at least 48 hours. Perform work in well-ventilated area, out of the way of construction dust and traffic to maintain clean adhesion.

C. Clean the substrate with detergent or non-flammable solvent as instructed by laminate manufacturer to remove wax, grease, and polish deposits.

D. Using a belt sander or sander instructed by manufacturer, sand entire surface to remove original finish. Remove sanding dust thoroughly.

E. Coat the sanded surface and back of laminate with a uniform coating of contact adhesive. Allow to dry thoroughly prior to assembling. Assembling wet adhesive lines will trap solvent and may result in poor bonding. Follow the adhesive manufacturer's instructions.

F. Index the laminate with the substrate. Make initial contact by smoothing with palms. Apply pressure using a "J" roller or rotary press. Allow to set as instructed by adhesive manufacturer to achieve full adhesion to maintain warranty. Trim with recommended tools.

G. Apply laminate to door faces and exposed vertical edges. Apply edges before face. Paint top and bottom edges to color match facing.

H. Coordinate hardware and vision lite cutouts with work of other Sections.

3.5 FINISH HARDWARE INSTALLATION

A. The supplier will mark each item of hardware for location. Protect the markings until each item is installed. If any item is delivered to the job not properly marked, return it to the supplier for marking before attempting to install it.

B. Check markings on hardware for proper location. Install and make necessary adjustments for proper working order. Any hardware damaged by improper adjustment or careless abuse will be replaced by Contractor at his expense.

C. Provide clean, properly sized, and accurately placed mortises and drilled holes for all mortise hardware such as locksets and for cylindrical locks where specified only.

D. Fit all surface-applied hardware accurately.

E. After hardware is installed, protect exposed surfaces by use of heavy paper and masking tape and maintain until job completion.

F. Remove all finish hardware except that which is primed for painting before painter's finish is

applied. Permanently replace and re-adjust for proper function after painter's finish has dried hard.

G. Millwork contractor shall be responsible for hardware on millwork.

3.6 PLASTIC LAMINATE FACED WOOD DOOR INSTALLATION

A. Protect all doors during handling.

B. Install doors in accordance with manufacturer’s instructions.

C. Install and adjust doors for smooth, quite operation.

D. Refer to Section 08 71 00 Door Hardware where applicable.

END OF SECTION 06 20 00

SECTION 06 40 00 ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
1. Plastic laminate cabinets.
2. Plastic laminate and solid surface countertops.
3. Plastic laminate panels.
4. Standing and running trim.
5. Closet and utility shelving.
6. Shop finishing.
7. Accessories necessary for a complete installation.

B. Related Sections:
1. Section 06 10 00: Rough Carpentry.
2. Section 09 90 00: Painting and Coating.

1.3 DEFINITIONS

A. Architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.4 SUBMITTALS

A. Product Data:
1. Technical data for each type of product indicated including cabinet hardware and accessories:
a. Include data for fire retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings:
1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components:
a. Show details full size.
b. Show locations and sizes of furring, blocking, and hanging strips including concealed blocking and reinforcement specified in other Sections.
c. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in architectural woodwork.

C. Samples:
1. Lumber with or for transparent finish, not less than five inches (125 mm) wide by 24 inches (600 mm) long, for each species and cut, finished on one (1) side and one (1) edge.
2. Veneer faced panel products with or for transparent finish, eight inches by ten inches (200 by 250 mm), for each species and cut. Include at least one (1) face veneer seam and finish as specified.
3. Lumber and panel products with shop applied finish, 50 square inches (300 sq. cm) for

lumber and eight inches by ten inches (200 mm by 250 mm) for panels, for each finish system and color, with 1/2 of exposed surface finished.
4. Plastic laminates, eight inches by ten inches (200 mm by 250 mm), for each type, color, pattern, and surface finish and specified edge material applied to one (1) edge.
5. Quartz surfacing materials, six inches (6”) square.
6. Corner pieces:
   a. Cabinet front frame joints between stiles and rails, as well as exposed end pieces, 18 inches (450 mm) high by 18 inches (450 mm) wide by six inches (150 mm) deep.
7. Exposed cabinet hardware and accessories, one (1) unit for each type and finish.

D. Qualification Data: For fabricator/installer.

E. Woodwork Quality Standard Compliance Certificates: Woodwork Institute (WI) Quality Certification Program certificates (CCP).

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Building code: Comply with applicable requirements of CBC Chapter 8 for Interior Finishes.
2. Accessibility:
   a. 2022 California Building Code; Section 11B-309 for Casework, Section 11B-404 Doors and Hardware and Section 11B-703 for Signage (where applicable).
   b. ADA Accessibility Guidelines (ADAAG) for Buildings and Facilities; final guidelines and revisions.
3. Quality standard: Unless otherwise indicated, comply with WI for premium grade architectural woodwork indicated for construction, finishes, installation, and requirements. Provide certified compliance labels and certificates indicating that woodwork, including installation, complies with requirements of grades specified.
4. Fire test response characteristics: Where fire retardant materials or products are indicated, provide materials and products with specified fire test response characteristics determined by testing identical products per test method indicated by UL. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

B. Fabricator Qualifications: Shop having minimum five (5) years’ documented experience who employs skilled workers who custom fabricate products similar to those required and who is a participating member of WI.

C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence matched wood veneers and transparent finished wood doors that are required to be of same species as woodwork.

D. Quality Standard: Unless otherwise indicated, comply with North American Architectural Woodwork Standards, meeting or exceeding ANSI A161.1, for grades of architectural woodwork indicated for construction, finishes, installation, and requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork is completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide materials that comply with requirements of WI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Products:
   1. Hardboard: AHA A135.4.
   2. Medium density fiberboard:
      a. ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde; minimum 48 pcf density except that minimum for screw holding capacity on face shall be 300 pounds; minimum 3/4 inches (19 mm) thick, edged and faced as specified:
         1) Arauco; Trupan MDF, VESTA Technology.
         2) Roseburg Forest Products, Inc.; Roseburg MDF products.
         3) Approved equal.
   3. Particleboard: Unless otherwise noted by District, particleboard is not to be used.
   4. Softwood plywood: DOC PS 1, medium density overlay.

C. Lumber:
   1. Comply with applicable provisions for grading and workmanship of WI Quality Standards, and requirements specified. Provide lumber surfaced 4 sides (S4S) and fabricated to profiles shown. Kiln dry lumber to 19 percent moisture content:
      a. Furring, blocking, and shims: No. 1 Common; Southern Pine.
      b. Solid hardwood for opaque finish: Plain sawn Yellow Poplar, free from checks, splits, and sound knots.

D. Drawer Locks
   1. Compx National Security Products

E. Thermoset Decorative Panels:
   1. Particleboard or medium density fiberboard finished with thermally fused, melamine impregnated decorative paper complying with LMA SAT-1:
      a. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with exposed or semi-exposed edges.

F. High Pressure Decorative Laminate - NEMA LD 3, grade indicated or as required by woodwork quality standard:
   1. Manufacturer is subject to compliance with requirements; provide high pressure decorative laminates by one of the following:
      a. Abet Laminati, Inc.
      b. Formica Corporation.
      c. Panolam Surface Systems by Panolam Industries International Incorporated.
      d. Wilsonart LLC.

2.2 FIRE RETARDANT TREATED MATERIALS

A. Where fire retardant treated materials are indicated, use materials complying with requirements acceptable to authorities having jurisdiction, and with fire test response characteristics specified:
   1. Do not use treated materials that do not comply with requirements of referenced woodworking standard or that are warped, discolored, or defective.
   2. Use fire retardant treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from

untreated materials.

3. Identify fire retardant treated materials with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

B. Fire Retardant Particleboard:
   1. Panels complying with requirements, made from softwood particles and fire retardant chemicals mixed together at time of panel manufacture to achieve flame spread index of 25 or less and smoke developed index of 50 or less per ASTM E84:
      a. For panels 3/4 inch (19 mm) thick and less, comply with ANSI A208.1 for Grade M-2 except for the following minimum properties: Modulus of rupture, 1,600 psi 11 MPa; modulus of elasticity, 300,000 psi 2,070 MPa; internal bond, 80 psi 550 kPa; and screw-holding capacity on face and edge, 250 and 225 lbf 1,100 and 1,000 N, respectively.
      b. For panels 13/16 inch to 1-1/4 inches (20 to 32 mm) thick, comply with ANSI A208.1 for Grade M-1 except for the following minimum properties: Modulus of rupture, 1,300 psi 9 MPa; modulus of elasticity, 250,000 psi 1,720 MPa; linear expansion, 0.50 percent; and screw-holding capacity on face and edge, 250 and 175 lbf 1,100 and 780 N, respectively.
      c. Product: Subject to compliance with requirements, provide Duraflake FR by Arauco.

C. Fire Retardant Fiberboard: Medium density fiberboard panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire retardant chemicals mixed together at time of panel manufacture to achieve flame spread index of 25 or less and smoke developed index of 200 or less in accordance with ASTM E84.

2.3 CABINET HARDWARE AND ACCESSORIES

A. Hardware Standard: Comply with BHMA A156.9 for items indicated by referencing BHMA numbers of items referenced to this standard. Provide cabinet hardware and accessory materials associated with architectural cabinets.

B. Frameless Concealed Hinges (European Type) - BHMA A156.9, B01602, Self-Closing:
   1. Provide 170-degree minimum opening capabilities. For end doors perpendicular to walls, provide 90-degree type.
   2. For doors 32 inches high or less, provide two (2) pairs of hinges, add 1/2 pair for every additional 20 inches.
   3. Products are subject to compliance with requirements; provide from one of the following:
      a. Hafele North America Co.
      b. Julius Blum, Inc.
      c. Mepla-Alfit, Inc.

C. Wire Pulls: Back mounted, solid metal, five inches (127 mm) long, 2-1/2 inches (63.5 mm) deep, and 5/16 inch (8 mm) in diameter.

D. Catches - Magnetic, Complying with BHMA A156.9 and B03161:
   1. Rockwood 901 by Assa Abloy.
   2. Comparable product.

E. Cabinet Shelf Rests - Nickel plated, 7 mm diameter shelf support pegs in brass sockets, complying with BHMA A156.9, B04013:
   1. Hafele 282.01.701 x 282.50.704 or comparable product.

F. Closet Rods and Flanges: 1-1/2-inch diameter, satin finished chrome plated steel or satin finished stainless steel with matching end flanges.

G. Adjustable Shelf Standards and Brackets for Wall Hung Open Shelving - BHMA A156.9, B04071; With Shelf Rests, B04081:
   1. Standards: Model No. 87ANO Super Duty 87/186/187 Steel Series; lengths as indicated, by Knape & Vogt or comparable product.
   2. Brackets: Model No. 187 LL ANO 12 to 24 for 12-inch to 24-inch (300 mm to 600 mm) deep shelves by Knape & Vogt or comparable product.
   3. Shelf rests: Model No. 210 ANO End Rest and Model No. 211 ANO Center Rest with Model No. 129 RUB Rubber Cushions or comparable product.

H. Shelf Rests: BHMA A156.9, B04013; metal, two pin type with shelf hold down clip.

I. Silencers:
   1. Provide rubber silencers on jamb and/or head and sill strike areas of all cabinet doors and drawers, two (2) for paired doors, and three (3) for single doors:
      a. Size: Approximately 1/4-inch (6.4 mm) diameter.
      b. Color: Compatible with adjacent finish.

J. Drawer Slides - BHMA A156.9, B05091:
   1. Provide positive stop, self-closing side mounted, full extension, zinc plated steel drawer slides with steel ball bearings:
      a. Pencil drawer slides: Grade 1; for drawers not more than three inches (75 mm) high and 24 inches (600 mm) wide; Accuride 2006 having 3/4 extension carburized steel ball bearing, side mounting, 45-pound capacity medium duty load rating, cold rolled steel slide members and ball retainers, bright electro zinc plate finish.
      b. Box drawers (less than eight inches [8”] deep): Grade 1HD-100; for drawers not more than six inches (150 mm) high and 24 inches (600 mm) wide. Provide Accuride 4034; up to 24 inches wide, full extension carburized steel ball bearing, side mounting, 150-pound capacity medium duty load rating, cold rolled steel slide members and ball retainers, cushioned in and out stops, detent-in, progressive action, positive stop, clear zinc finish.
      c. Pedestal drawers (greater than eight inches [8”] deep): Accuride 4032; up to 24 inches wide, full extension carburized steel ball bearing, rail mounting, minimum 150-pound capacity heavy duty load rating, cold rolled steel slide members and ball retainers, cushioned in and out stops, detent-in, progressive action, positive stop, bright electro zinc plate finish.
      d. Lateral file drawer slides: For drawers more than six inches (150 mm) high or 24 inches (600 mm) wide; heavy-duty, up to 42 inches wide, 3640A by Accuride.
      e. Keyboard slide: Model No. 2109, color black, by Accuride, Inc.
      f. Refuse cabinets: Accuride C3600-201D, full extension carburized steel ball bearing, bracket mounting, heavy-duty, cold rolled steel slide members and ball retainers, cushioned in and out stops, progressive action, positive stop, clear zinc plate finish.

K. Door and Drawer Locks:
   1. Provide locks for each cabinet door and drawer as indicated on Drawings. Finish exposed portions of locks to match cabinet pull finish. Furnish two (2) keys with each lock and key locks inside one room alike and provide master key for locks in Project. Selections to meet BHMA A156.11 and E07041 (for drawers) or E07121 (for doors):
      a. Cam lock similar to Hafele 235.20.20x, chrome plated, with offset cam 219.13.9xx, sized to fit opening.
      b. Cam lock similar to Hafele 235.20.20x, chrome plated, with surface mounted strike 251.60.703.
      c. Pairs of doors:

1) Inactive leaf: Furniture bolt similar to Hafele 252.02.644, polished chrome, with strike 251.60.703.
2) Active leaf: Single door lock assembly.

L. Grommets for Cable Passage through Countertops:
1. Two-inch (51 mm), black, molded plastic grommets and matching plastic caps with slot for wire passage:
a. Product: Subject to compliance with requirements, provide TG series by Doug Mockett & Company, Inc.

M. Trash Grommet Through Countertop: TM1B, six-inch by two-inch (6” x 2”) polished stainless-steel grommet by Doug Mockett and Co., Inc.

N. Exposed Hardware Finishes:
1. For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated:
a. Satin chromium plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.

O. Concealed Hardware: Provide finish complying with product class requirements in BHMA A156.9.

2.4 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire retardant treated softwood lumber, kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous metal or hot dip galvanized anchors and inserts on inside face of exterior walls and as required for corrosion resistance. Provide toothed steel or lead expansion sleeves for drilled in place anchors.

C. Hanging (Zee Clip) Strips: Extruded aluminum zee type interlocking clips; type, size and quantity for the condition of use.

D. Screws: Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements.

E. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.

F. Blind Splines: Specialty devices, as required for tight butt joining, types and size as recommended by woodwork fabricator.

G. Covercaps: Where mortises of fastener heads or drawdowns are exposed (blind holes) in finished work, provide black plastic covercaps.

H. Adhesive for Bonding Plastic Laminate:
1. Resorcinol:
a. Adhesive for bonding edges: Hot melt adhesive.

I. Stone Seam Adhesive:
1. Two-part, epoxy resin stone adhesive with an initial set time of not more than two (2) hours at 70 degrees F (21 degrees C), and with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

a. Color: Clear.
b. Products: Subject to compliance with requirements, provide Bonstone Materials Corporation - Duproxi or Akemi North America - Akepox.

J. Stone Sealer:
1. Colorless, nonstaining, single component, neutral curing silicone sealant that does not affect color or physical properties of stone surfaces, recommended by stone producer for application indicated. Subject to compliance with requirements, provide products by one of the following:
a. Bostik, Inc.
b. Custom Building Products.
c. Hillyard, Inc.

K. Stone Cleaner: Cleaner specifically formulated for stone types, finishes, and applications indicated, recommended by stone producer and by sealer manufacturer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.

2.5 FABRICATION

A. Woodwork Grade:
1. WI Custom Grade woodwork complying with referenced quality standard:
a. Complete fabrication, including assembly, finishing, and hardware application, before shipment to site to the maximum extent possible. Disassemble components as necessary for shipment and installation. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting. The width of scribe and filler panels shall not exceed 1/2 inch or 1/2-inch clear dimension from adjacent wall to outside face of cabinet door in a 90-degree position, whichever is greater.
b. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify various parts fit as intended and check measurements of assemblies against field measurements indicated on shop drawings before disassembling for shipment.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Sand fire retardant treated wood lightly to remove raised grain on exposed surfaces before fabrication.

D. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
1. Corners of cabinets and edges of solid wood (lumber) members 3/4 inch (19 mm) thick or less: 1/16 inch (1.5 mm).
2. Corners of cabinets and edges of solid wood (lumber) members 3/4 inch (19 mm) thick or less: 1-1/2 inch (38 mm).
3. Corners of cabinets and edges of solid wood (lumber) members and rails: 1/16 inch (1.5 mm).

E. Shop cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs:
1. Seal edges of openings in countertops with a coat of varnish.

F. Plastic Laminate Faced Wood Paneling - WS Premium Grade:
1. Plastic laminate - high pressure decorative laminate complying with NEMA LD 3:
   a. Faces: Grade SGF.
   b. Backs: Grade BKH.
   c. Exposed edges: Same as faces.
2. Colors, patterns, and finishes:
   a. Wood grains, matte finish:
      1) Grain direction: Vertical.
3. Panel core - particleboard or medium density fiberboard:
   a. Thickness: 3/4 inch (19 mm).
4. Exposed panel edges:
   a. Applied solid wood banding 11/16 inch (18 mm) thick by depth of panels.
5. Adhesive for bonding edges: Hot melt adhesive or adhesive for faces.
6. Assemble panels by gluing and concealed fastening.

G. Plastic Laminate Cabinets - WS Premium Grade:
1. WI type of cabinet construction: Flush overlay.
2. Materials:
   a. Laminate cladding for exposed surfaces - high pressure decorative laminate:
      1) Horizontal surfaces other than tops: Grade HGS.
      2) Post formed surfaces: Grade HGP.
      3) Vertical surfaces: Grade VGS.
      4) Edges: Grade HGS.
   b. Semi-exposed surfaces:
      1) Surfaces other than drawer bodies - thermoset decorative panels:
         a) Edges of plastic laminate shelves: Grade HGS, matching laminate in color, pattern, and finish.
         b) For semi-exposed backs of panels with exposed plastic laminate surfaces, provide surface of high pressure decorative laminate, Grade VGS.
      2) Drawer sides and backs: Solid hardwood lumber.
      3) Drawer bottoms: Hardwood plywood.
   c. Concealed backs of panels with exposed plastic laminate surfaces: High pressure decorative laminate, Grade BKL.
3. Colors, patterns, and finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces indicated in Finish Schedule.
4. Provide dust panels of 1/4 inch (6.4 mm) plywood or tempered hardboard above compartments and drawers, unless located directly under tops.
5. Fabrication:
   a. Join case body members using concealed dado or dowel methods utilizing glue and pressure. Reinforce dado method with nailing or screws. Mechanical fasteners are not permitted:
      1) Base cabinet bottoms and subtops: Bottoms, 3/4-inch particleboard with low pressure laminate finish on interior side and phenolic backing sheet on concealed side. Subtops, 3/4-inch particleboard with phenolic backing sheet both sides. Fabricate all base cabinets with subtops.
      2) Wall cabinet tops and bottoms: Tops, one-inch (1”) particleboard with low pressure laminate finish on interior side and phenolic backing sheet on concealed side. Bottoms, one-inch (1”) particleboard with manufacturer's low pressure laminate finish both sides.
      3) Cabinet ends: 3/4-inch particleboard with low pressure laminate finish on interior side and phenolic backing sheet on concealed side. Install high pressure plastic laminate on exposed sides of cabinet ends.
      4) Cabinet backs - 1/4-inch hardboard with low pressure laminate finish for standard unexposed backs:
         a) Fabricate with continuous hot melt glue joint between sides, tops,

bottoms, and back on concealed side.
b) Exposed backs: 3/4-inch particleboard with low pressure laminate finish on interior side and high pressure plastic laminate on exterior, exposed side.

5) Cabinet shelves (adjustable, semi-concealed): 3/4-inch particleboard with low pressure laminate finish on both sides. Provide one-inch (1") particleboard for shelves for unsupported spans over 36 inches.
6) Cabinet doors: 3/4-inch particleboard with high pressure plastic laminate on exterior side and heavy gauge balancing sheet on interior side.
7) Drawer fronts: 3/4-inch particleboard with high pressure plastic laminate on exterior side and heavy gauge balancing sheet on interior side.
8) Drawer construction - 1/2-inch solid hardwood back, sides, and subfront; tongued and dadoed into back and subfront, joints glued and pinned; 1/4-inch hardboard bottom tongued and dadoed in all four sides, back, and subfront. Provide additional support with continuous hot melt glue joint on underside of drawers between sides, back, subfront, and bottom:
   a) Reinforce drawer bottoms as required with spreaders.
   b) Apply drawer front to subfront in accordance with manufacturer's standard procedures.
   c) Dividers: 3/4-inch particleboard with manufacturer's low pressure laminate finish on both sides. Secure to inside of cabinet with manufacturer's standard plastic clips.
   d) Dust panels: Provide dust panels of 1/4-inch plywood or tempered hardboard above compartments and drawers except where located directly under tops.
   e) Finish exterior exposed surfaces with high pressure plastic laminate. Laminate plastic to particleboard core with balancing sheet using urea resin formaldehyde glue. Fabricate using cold press method with regulated pressure for minimum eight hours at minimum 70 degrees F.

H. Countertops - WI Premium Grade:
1. Solid surface:
   a. Solid surfacing material thickness: 3/4 inch (19 mm).
   b. Colors, patterns, and finishes: Provide materials and products resulting in colors of solid surfacing material indicated on Drawings.
2. Quartz countertops:
   a. Seams:
      1) Fabricate countertops without seams to the extent possible. When seams are necessary, fabricate countertops in sections indicated for joining in field, with sealant filled seams 1/16 inch (1.5 mm) in width.
   b. Fittings: Drill countertops in shop for fittings and similar items.
   c. Fabricate with four-inch (4") backsplashes. Sand minor scratches and stains with #400 then #600 sandpaper.
3. Fabrication:
   a. Fabricate tops in one piece, unless otherwise indicated. Comply with solid surfacing material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing:
      1) Fabricate tops with shop applied edges of materials and configuration indicated.
      2) Fabricate tops with loose backsplashes for field application.
   b. Drill holes in countertops for plumbing fittings and soap dispensers in shop.
4. Countertop construction tolerances:
   a. Variation from plumb: For vertical lines and surfaces, do not exceed 1/16 inch in 48 inches (1.5 mm in 1,200 mm).
   b. Variation from level: Do not exceed 1/8 inch in 96 inches (3 mm in 2,400 mm), 1/4 inch (6 mm) maximum.

c. Variation in joint width: Do not vary joint thickness more than 1/4 of nominal joint width.
d. Variation in plane at joints (lipping): Do not exceed 1/64-inch (0.4 mm) difference between planes of adjacent units.
e. Variation in line of edge at joints (lipping): Do not exceed 1/64-inch (0.4-mm) difference between edges of adjacent units, where edge line continues across joint.

2.6 SHELVING

A. Closet and Utility Shelving:
1. Grade: WI Custom.
2. Shelf material: 3/4 inch (19 mm) medium density fiberboard with solid lumber edge.
3. Cleats: 3/4-inch (19 mm) solid lumber.

2.7 SHOP FINISHING

A. Grade: WI Premium grade.

B. Shop finish architectural woodwork at fabrication shop. Defer final touchup, cleaning, and polishing until installation.

C. Produce finish architectural woodwork at fabrication shop. Defer only final touchup, cleaning, and polishing until after installation.

D. Preparations for Finishing:
1. Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work:
a. Back priming: Apply one (1) coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two (2) coats to back of paneling and to end grain surfaces. Concealed surfaces of plastic laminate clad woodwork do not require back priming when surfaced with plastic laminate, backing paper, or thermoset decorative overlay.

E. Exposed Surfaces - WI Premium Grade:
1. Plastic laminate finish: Use hot plate method for gluing of plastic laminate surfacing materials; glued surfaces shall be in close contact throughout. Glue stains are not permitted.
2. Solid surfacing finish: As scheduled.

F. Unexposed Wood Finish: Water based alkyd type primer/sealer.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements:
1. Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work:

a. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on shop drawings.
b. Established dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

3.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork will be supported and installed as indicated.

3.3 PREPARATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Before installing architectural woodwork, examine shop fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.4 INSTALLATION

A. Grade: Install woodwork to comply with requirements for grade specified for fabrication of type of woodwork involved.

B. Assemble woodwork and complete fabrication at site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2,400 mm). Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

C. Fire Retardant Treated Wood: Handle, store, and install fire retardant treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.

D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails (or finishing screws) for exposed fastening, countersunk, and filled flush with woodwork and matching final finish if transparent finish is indicated.

E. Plastic Laminate Paneling:
1. Install paneling to comply with same grade as paneling to be installed:
a. Install paneling level, plumb, true, and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2,400 mm). Install with no more than 1/16 inch in 96 inches (1.6 mm in 2,400 mm) vertical cup or bow and 1/8 inch in 96 inches (3 mm in 2,400 mm) horizontal variation from a true plane.
b. Anchor paneling to supporting substrate with blind nailing. Do not use face fastening unless covered by trim.

F. Cabinets:
1. Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide

unencumbered operation. Complete installation of hardware and accessory items as indicated:

a. Install cabinets with no more than 1/8 inch in 96 inches (3 mm in 2,400 mm) sag, bow, or variation from a straight line.
b. Maintain veneer sequence matching of cabinets with transparent finish.
c. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with No. 10 wafer head screws sized for 1 inch (25 mm) penetration into wood framing, blocking, or hanging strips or toggle bolts through metal backing or metal framing behind walls.

G. Countertops:
1. Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop:
a. Install countertops with no more than 1/8 inch in 96 inches (93 mm in 2,400 mm) sag, bow, or variation from a straight line.
b. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and to walls with adhesive.
c. Caulk space between backsplash and wall with silicone sealant.

H. Solid Surface and Stone Countertop:
1. Install components plumb and level scribed to adjacent finishes. Fabricate with backsplashes. Sand minor scratches and stain:
a. Align adjacent stone and solid surfacing material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
b. Do not cut in field unless otherwise indicated. If countertops or splashes require additional fabrication not specified to be performed at site, return to fabrication shop for adjustment.
c. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
d. Set stone and solid surface materials to comply with requirements indicated on Drawings and shop drawings. Shim and adjust to locations indicated, with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances. Install anchors and attachments indicated or necessary to secure countertops in place.
e. Where backsplash is indicated, install backsplash and end splash by adhering to wall with water-cleanable epoxy adhesive and to countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
f. Adhesive top mount sinks/bowls to countertops using manufacturer's recommended adhesives and color matched silicone sealants.
g. Keep components clean during installation. Remove adhesives, sealants, and stains. Replace stained components.
h. Apply sealant to joints and gaps; comply with Division 07: Thermal and Moisture Protection. Remove temporary shims before applying sealant.
i. Make plumbing connections to sinks in accordance with plumbing requirements.
j. Protect surfaces from damage. Repair work or replace damaged work that cannot be repaired to Architect's satisfaction.

I. Closet and Utility Shelving:
1. Cut shelf cleats at ends of shelves about 1/2 inch (13 mm) less than width of shelves and sand exposed ends smooth:
a. Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled. Space fasteners maximum 16 inches (400 mm) o.c.
b. Install shelf brackets according to manufacturer's written instructions, spaced

maximum 36 inches (900 mm) o.c. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

c. Install standards for adjustable shelf supports according to manufacturer's written instructions. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors. Space fasteners maximum 12 inches (300 mm) o.c.

d. Install standards for adjustable shelf brackets according to manufacturer's written instructions, spaced maximum 36 inches (900 mm) o.c. and within six inches (150 mm) of end of shelves. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

e. Cut shelves to neatly fit openings with only enough gap to allow shelves to be removed and reinstalled. Install shelves, fully seated on cleats, brackets, and supports:
   1) Fasten shelves to cleats with finish nails or trim screws, set flush.
   2) Fasten shelves to brackets to comply with bracket manufacturer's written instructions.

J. Touch up finishing work. Fill nail holes with matching filler where exposed.

K. Construction Tolerances:
1. Variation from plumb: For vertical lines and surfaces, do not exceed 1/16 inch in 48 inches (1.5 mm in 1,200 mm).
2. Variation from level: Do not exceed 1/8 inch in 96 inches (3 mm in 2,400 mm), 1/4-inch (6 mm) maximum.
3. Variation in joint width: Do not vary joint thickness more than 1/4 of nominal joint width.
4. Variation in plane at joints (lipping): Do not exceed 1/64-inch (0.4 mm) difference between planes of adjacent units.
5. Variation in line of edge at joints (lipping): Do not exceed 1/64-inch (0.4 mm) difference between edges of adjacent units, where edge line continues across joint.

3.5 SITE ENVIRONMENTAL PROCEDURES

A. Indoor Air Quality: Provide temporary ventilation during work.

B. Waste Management:
1. Comply with requirements of Section 01 74 19: Construction Waste Management and Disposal:
   a. Select wood sizes to minimize waste; reuse scrap to the greatest extent possible. Clearly separate scrap for use on site as accessory components, including shims, bracing, and blocking.
   b. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
   c. Prevent saw dust and wood shavings from entering the storm drainage system.
   d. Do not burn scrap lumber that has been pressure treated.
   e. Do not send lumber treated with pentachlorophenol, CCA, or ACA to cogeneration facilities or waste to energy facilities.

3.6 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop applied finishes to restore damaged or soiled areas.

D. Countertops:
   1. Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately:
      a. In-progress cleaning: Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
      b. Remove and replace countertops that are:
         1) Broken, chipped, stained, or otherwise damaged. Stone may be repaired if methods and results are approved by Architect. Repair solid surface in accordance with manufacturer recommendations when approved by Architect.
         2) Defective countertops.
         3) Defective joints, including misaligned joints.
      c. Replace complying with requirements and showing no evidence of replacement.

E. Stone: Clean stone countertops not less than six (6) days after completion of sealant installation, using clean water and soft rags. Do not use wire brushes, acid type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage stone.

F. Stone Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's written instructions.

3.7 PROTECTION

A. Provide final protection and maintain conditions, acceptable to manufacturer and installer, ensuring woodwork is without damage or deterioration at time of Substantial Completion.

END OF SECTION 06 40 00

SECTION 06 48 00 WOOD FRAMES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Exterior frames and jambs.
   2. Interior frames and jambs.

1.3 SUBMITTALS

A. Product Data:
   1. For each type of product, including fire retardant treated materials and finishing materials and processes:
      a. Include data for fire retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Samples for Initial Selection:
   1. Shop-applied transparent finishes.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver wood frames until operations that could damage wood frames have been completed in installation areas. If wood frames must be stored in other than installation areas, store only in areas where environmental conditions are appropriate for protection of materials.

PART 2 PRODUCTS

2.1 FRAMES AND JAMBS FOR TRANSPARENT FINISH

A. Grade: Premium.

B. Wood Species: Southern yellow pine.

C. For frames or jambs wider than available lumber, use veneered construction. Do not glue for width.

D. Fire-Rated Interior Frames and Jambs:
   1. Products fabricated from fire retardant particleboard or fire retardant medium-density fiberboard with veneered exposed surfaces and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252:
      a. Fire rating: 20 minutes.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality

standard for each type of wood frame and quality grade specified unless otherwise indicated.

B. Water-Repellent Preservative Treated Materials:
   1. Comply with AWPA N1 (dip, spray, flood, or vacuum-pressure treatment) for exterior wood frames indicated to receive water-repellent preservative treatment:
      a. Preservative chemicals: 3-iodo-2-propynyl butyl carbamate (IPBC), combined with an insecticide containing chloropyrifos (CPF).
      b. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated material.
      c. Extent of water-repellent preservative treatment: Treat all exterior wood frames unless otherwise indicated.

2.3 FIRE RETARDANT TREATED MATERIALS

A. Fire Retardant Treated Materials, General:
   1. Where fire retardant treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency:
      a. Identify fire retardant treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

B. Fire Retardant Treated Lumber:
   1. Products with a flame spread index of 25 or less when tested according to ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test:
      a. Kiln dry lumber after treatment to a maximum moisture content of 19 percent.

2.4 MISCELLANEOUS MATERIALS

A. Exterior Blocking, Shims, and Nailers:
   1. Softwood or hardwood lumber, pressure preservative treated, fire retardant treated, kiln dried to less than 15 percent moisture content:
      a. Preservative treatment by pressure process - AWPA U1; Use Category UC3b:
         1) Kiln dry lumber after treatment to a maximum moisture content of 19 percent.
         2) Preservative chemicals: Acceptable to authorities having jurisdiction.
         3) Mark lumber with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee's (ALSC) Board of Review.

B. Interior Blocking, Shims, and Nailers: Fire retardant treated softwood lumber, kiln dried to less than 15 percent moisture content.

C. Nails for Exterior Use: Hot-dip galvanized.

D. Screws for Exterior Use: Hot-dip galvanized.

E. Provide self-drilling screws for metal framing supports, as recommended by metal framing manufacturer.

F. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post installed anchors.

Use nonferrous metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.5 FABRICATION

A. Fabricate wood frames to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Edges of solid-wood (lumber) members: 1/16 inch (1.5 mm) unless otherwise indicated.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Weather Limitations for Exterior Work: Proceed with installation of exterior wood frames only when existing and forecasted weather conditions permit work to be performed and at least one (1) coat of specified finish to be applied without exposure to rain, snow, or dampness.

B. Environmental Limitations for Interior Work: Do not deliver or install interior wood frames until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

C. Environmental Limitations for Interior Work: Do not deliver or install interior wood frames until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.

D. Field Measurements:
   1. Where wood frames are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work:
      a. Locate concealed framing, blocking, and reinforcements that support wood frames by field measurements before being enclosed, and indicate measurements on Shop Drawings.

E. Established Dimensions: Where wood frames are indicated to fit to other construction, establish dimensions for areas where wood frames are to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

3.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood frames can be supported and installed as indicated.

3.3 PREPARATION

A. Before installation, condition wood frames to average prevailing humidity conditions in installation areas.

B. Before installing wood frames, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.4 INSTALLATION

A. Grade: Install wood frames to comply with same grade as item to be installed.

B. Assemble wood frames and complete fabrication at Project site to the extent that it was not completed in the shop.

C. Install wood frames level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2,400 mm).

D. Scribe and cut wood frames to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Fire Retardant Treated Wood: Handle, store, and install fire retardant treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.

F. Anchor wood frames to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork:
   1. For shop finished items, use filler matching finish of items being installed.

G. Touch up finishing work specified in this Section after installation of wood frames. Fill nail holes with matching filler where exposed:
   1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.5 ADJUSTING AND CLEANING

A. Repair damaged and defective wood frames, where possible, to eliminate functional and visual defects; where not possible to repair, replace wood frames. Adjust joinery for uniform appearance.

B. Clean wood frames on exposed and semi-exposed surfaces. Touch up shop applied finishes to restore damaged or soiled areas.

END OF SECTION 06 48 00

SECTION 07 21 00 THERMAL INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Polyisocyanurate foam plastic board.
   2. Glass fiber blanket.
   3. Acoustical Insulation.
   4. Accessories necessary for a complete installation.

B. Related Sections:
   1. Section 06 10 53: Miscellaneous Rough Carpentry.
   2. Section 09 21 16: Gypsum Board Assemblies.

1.3 SUBMITTALS

A. Product Data: Technical data and installation instructions for each type of insulation product specified.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Fire performance characteristics - Identify products with appropriate markings of applicable testing and inspecting organization:
      a. Surface burning characteristic: ASTM E84.
      b. Flame spread index: Maximum 25.
      c. Smoke developed index: Maximum 450.
      d. Fire resistance ratings: ASTM E119.
      e. Combustion characteristics: ASTM E136.
   2. Underwriter's Laboratories (UL) 723 Tests for Surface Burning Characteristics of Building Materials.
   3. XXAQMD – X X Air Quality Management District Regulations Rules for Adhesive and Sealant Applications.
   4. Greenguard Children and Schools (http://www.greenguard.org/).

B. Single Source Responsibility for Insulation Products: Obtain each type of building insulation from single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of Work.

C. Environmental Requirements:
   1. Manufacture extruded polystyrene with HCFC or other CFC free blowing agents. Mark insulation boards and packages with manufacturer's name and product designation. Unmarked boards and packages will be rejected:
      a. Wherever possible, provide boards from manufacturers who recycle insulation materials.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam plastic board insulation:
   1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
   2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
   3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 PRODUCTS

2.1 POLYISOCYANURATE FOAM PLASTIC BOARD

A. Polyisocyanurate Board, Foil Faced - ASTM C1289, Foil Faced, Type I, Class 1 or 2:
   1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      a. Atlas Roofing Corporation.
      b. Hunter Panels.
      c. DuPont.
      d. Firestone Building Products.
      e. Rmax, Inc.
      f. Approved equal.
   2. Fire propagation characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 GLASS FIBER BLANKET

A. Glass Fiber Blanket, Unfaced - ASTM C665, Type I; with maximum flame spread and smoke developed indexes of 25 and 50, respectively, per ASTM E84; passing ASTM E136 for combustion characteristics:
   1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      a. Johns Manville (Basis of Design).
      b. CertainTeed Corporation.
      c. Guardian Building Products, Inc.
      d. Owens Corning.
      e. Approved equal.

B. Glass Fiber Blanket, Polypropylene Scrim Kraft Faced - ASTM C665, Type II (non-reflective faced), Class A (faced surface with a flame spread index of 25 or less); Category 1 (membrane is a vapor barrier):
   1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      a. Johns Manville (Basis of Design).
      b. CertainTeed Corporation.
      c. Owens Corning.
      d. Approved equal.

2.3 ACOUSTICAL INSULATION

A. Glass Fiber Noise Reducer Blanket, Kraft-faced - ASTM C665, Type II; with maximum flame spread and smoke developed indexes of 25 and 50, respectively, per ASTM E84;

combustion characteristics. To be installed on interior wood stud framing:

1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
   a. CertainTeed Corporation (Basis of Design).
   b. Guardian Building Products, Inc.
   c. Johns Manville; a Berkshire Hathaway company.
   d. Owens Corning.
   e. Approved equal.

2.4 INSULATION FASTENERS

A. Adhesively Attached, Spindle Type Anchors:
   1. Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place:
      a. Plate: Perforated, galvanized carbon steel sheet, 0.030-inch (0.762 mm) thick by two inches (50 mm) square.
      b. Spindle: Copper coated, low carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation.

B. Adhesively Attached, Angle Shaped, and Spindle Type Anchors:
   1. Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place:
      a. Angle: Formed from 0.030-inch (0.762 mm) thick, perforated, galvanized carbon steel sheet with each leg two inches (50 mm) square.
      b. Spindle: Copper coated, low carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation.

C. Insulation Retaining Washers:
   1. Self-locking washers formed from 0.016-inch (0.41 mm) thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches (38 mm) square or in diameter:
      a. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:
         1) Crawl spaces.
         2) Ceiling plenums.
         3) Attic spaces.

D. Insulation Standoff: Spacer fabricated from galvanized mild steel sheet for fitting over spindle of insulation anchor to maintain air space of two inches (50 mm) between face of insulation and substrate to which anchor is attached.

E. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.

F. All other materials such as wire supports, fasteners, and retainers not specifically described but required to complete the work shall be as recommended by approved manufacturer, provided and installed by Contractor.

2.5 ACCESSORIES

A. Insulation for Miscellaneous Voids:
   1. Glass fiber insulation: ASTM C764, Type II, loose fill; with maximum flame spread and smoke developed indexes of 5, per ASTM E84.
   2. Spray polyurethane foam insulation: ASTM C1029, Type II, closed cell, with maximum flame spread and smoke developed indexes of 75 and 450, respectively, per

ASTM E84, and shall conform to all XXAQMD and EPA air quality regulations.

B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

C. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

B. Sequence work to ensure fireproofing and firestop materials are in place before beginning work.

3.2 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

B. Foam in Place Insulation:
   1. Verify that substrates are clean, dry, and free of substances that are harmful to insulation:
      a. Priming: Prime substrates where recommended by insulation manufacturer. Apply primer to comply with insulation manufacturer's written instructions. Confine primers to areas to be insulated; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Board and Batt Insulation:
   1. Install insulation that is undamaged, dry, and unsoiled and has not been exposed to ice, rain, or snow at any time:
      a. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
      b. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

C. Cavity Wall Insulation:
   1. Foam plastic board insulation:
      a. Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both

directions. Press units firmly against inside substrates:
1) Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in.

D. Framed Construction - Blanket Insulation:
1. Install in cavities formed by framing members according to the following requirements:
a. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
b. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
c. Maintain three-inch (76 mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
d. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
e. For metal framed wall cavities where cavity heights exceed 96 inches (2,438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
f. For wood framed construction, install blankets according to ASTM C1320 and as follows:
1) With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
g. Miscellaneous voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1) Glass fiber insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
2) Spray polyurethane insulation: Apply according to manufacturer's written instructions.

E. Reflective Insulation:
1. Install sheet reflective insulation according to ASTM C727:
a. Install sheet radiant barriers according to ASTM C1744.
b. Install interior radiation control coating system according to ASTM C1321.

F. Continuous Insulation for Exterior Walls (Polyisocyanurate Board):
1. Install continuous insulation board according to manufacturer's written instructions:
a. Fastener components shall include a minimum two-inch diameter plastic plate/washer and self-taping screws attached directly to stud framing.
b. All joints, penetrations, and flashings shall be taped and/or otherwise sealed with manufacture’s recommended products.

3.4 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 21 16 BATT INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section is related to batt Insulation and includes information regarding the provision of fiberglass batt thermal insulation for exterior envelope assemblies.

B. Reference Standards:
   1. Materials shall meet the property requirements of one or more of the following specifications as applicable to the specific product or end use:
      a. American Society for Testing of Materials (ASTM):
         1) ASTM C423 Test Method for Sound Absorption Coefficient by the Reverberation Room Method.
         2) ASTM C518 Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter.
         3) ASTM C665 Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
         4) ASTM C1320 Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
         5) ASTM E84 Test Method for Surface Burning Characteristics of Building Materials.
         6) ASTM E119 Test Methods for Fire Tests of Building Construction and Materials.

1.3 SUBMITTALS

A. Product Data: Submit data on product characteristics, performance criteria, and limitations, including installation instructions.

1.4 QUALITY ASSURANCE

A. Sustainable Design:
   1. Provide products which have received the following certifications:
      a. UL Certified Environmental Product Declaration in accordance with ISO 14025. Applies to EcoTouch® Faced and Unfaced Insulation.
      b. UL Environment EcoLogo CCD-106, applies to EcoTouch® Faced and Unfaced Insulation.
      c. GREENGUARD Indoor Air Quality Certified® and GREENGUARD Children & Schools Certified℠, applies to EcoTouch® Unfaced Batts and EcoTouch® Faced Batts and Rolls.
      d. GREENGUARD Formaldehyde Free, applies to EcoTouch® Unfaced and EcoTouch® Faced Batts and Rolls.
      e. Scientific Certification Systems SCS-MC-01025, SCS Certified minimum 65 percent recycled glass content (with at least 41 percent post-consumer recycled and the balance of pre-consumer recycled glass content), applies to EcoTouch® Unfaced Batts and Rolls.
      f. Scientific Certification Systems SCS-MC-02676, SCS Certified minimum 58

percent recycled glass content (with at least 36 percent post-consumer recycled and the balance of pre-consumer recycled glass content), applies to EcoTouch® Faced Batts and Rolls.

g. USDA Certified Biobased Products: EcoTouch® unfaced – 98 percent; EcoTouch® Kraft-faced – 57 percent; EcoTouch® FSK-faced – 78 percent.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original packaging.

B. Store and protect products in accordance with manufacturer's instructions. Store in a dry indoors location. Protect insulation materials from moisture and soiling.

C. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

D. Do not install insulation that has been damaged or wet; remove it from jobsite:
   1. An exception may be allowed in cases where Contractor is able to demonstrate that wet insulation when fully dried out (either before installation or afterward following exposure to system operating temperatures) will provide installed performance that is equivalent in respects to new, completely dry insulation. In such cases, consult the insulation manufacturer for technical assistance.

PART 2 PRODUCTS

2.1 BASIS OF DESIGN

A. Thermal Insulation: EcoTouch® PINK® FIBERGLAS™ Insulation with PureFiber® Technology by Owens-Corning, Toledo, OH 43659; www.owenscorning.com.

2.2 MATERIALS

A. EcoTouch® FS-25 Batt Insulation - ASTM C665, Type II (PSK facing), Class A and Type III (FSK facing), Class A preformed formaldehyde free glass fiber batt, poly/scrim/Kraft (PSK) or foil/scrim/Kraft (FSK) faced on one side:
   1. Flame spread less than 25, smoke developed index less than 50 per ASTM E84.
   2. ICC building construction classification: All types.
   3. Perm rating: 0.02 maximum per ASTM E96.

B. Accessories:
   1. Provide accessories per insulating system manufacturer's recommendations, including the following:
      a. Tape: Polyethylene self-adhering type for Kraft faced insulation and bright aluminum self-adhering type for foil faced insulation.
      b. Insulation fasteners: Impale clip of galvanized steel; type recommended by insulation manufacturer for particular use intended.
      c. Mechanical insulation fasteners: FM approved, corrosion resistant, size required to suit application.
      d. Wire mesh: Galvanized steel, hexagonal wire mesh.
      e. Spindle fasteners: Corrosion-resistant wire spindles.
      f. Ventilation baffles: Formed plastic, metal, or cardboard sized to fit full width of rafter spaces.

2.3 PERFORMANCE CRITERIA

A. Wood Frame Construction - Walls, R-Value - Per ASTM C518:
   1. R-21, 5-1/2-inch (139 mm) thickness, 15-inch (381 mm) or 23-inch (584 mm) width, 93-inch (2,362 mm) length at six-inch (6”) studs.
   2. R-25, 15-inch (381 mm) or 23-inch (584 mm) width, 93-inch (2,362 mm) length at eight-inch (8”) and 10-inch (10”) studs.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be installed. Verify that adjacent materials are dry and ready to receive insulation. Verify mechanical and electrical services within walls have been tested and inspected.

B. Provide written report listing conditions detrimental to performance of work in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's installation instructions and ASTM C1320.

B. Friction-fit blanket insulation in place, until the interior finish is applied. Install batts to fill entire stud cavity, with no gaps, voids, or areas of compression. If stud cavity is less than eight feet (8’) in height, cut lengths to friction fit against floor and ceiling tracks. Walls with penetrations require that insulation be carefully cut to fit around outlets, junction boxes, and other irregularities:
   1. Do not install insulation on top of or within three inches (3”) of recessed light fixtures unless the fixtures are approved for such use.

C. Within exterior wall framing, install insulation between pipes and backside of sheathing. Cut or split insulation material as required to fit around wiring and plumbing.

D. Where showers and bathtubs are located on exterior walls, install insulation and vapor retarder air barrier between units and exterior.

E. If eave ventilation baffles are required, install ventilation baffles at eaves to hold insulation down from roof sheathing and provide positive ventilation from eave to attic space.

F. Fluff insulation to full thickness for specified R-value before installation. Do not compress insulation in the cavity during installation, creating gaps or voids that could diminish thermal value.

G. Trim insulation neatly to fit spaces. Fill miscellaneous gaps and voids with insulation.

H. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation.

I. For unfaced batt insulation, install with friction fit or retain in place with manufacturer’s recommended fasteners or mesh.

J. For batt insulation with factory-applied facing, install with vapor retarder membrane facing warm in the winter side of building spaces or as specified by local building code. Lap ends and side flanges of membrane over or between framing members. Tape to seal tears, cuts, or misalignments in membrane.

K. Secure insulation in place using one of the following methods: Friction fit; staple or nail facing flanges in place as needed, tape in place, retain in place with spindle fasteners, retain in place with wire mesh secured to framing members.

3.3 PROTECTION

A. Protect installed insulation from damage due to weather and physical abuse until protected by permanent construction.

END OF SECTION 07 21 16

SECTION 07 41 13 METAL ROOF PANELS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes prefinished, prefabricated standing seam roof system with continuous seams:
   1. Standing seam metal roof panels.
   2. Roof insulation.
   3. Vapor barrier.
   4. Flashings.
   5. Gutter, downspouts, and splash blocks.
   6. Roof jacks.
   7. Roof curbs.
   8. All supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, weathertight, and complete installation.

B. Related Sections:
   1. Section 07 62 00: Sheet Metal Flashing and Trim.
   2. Section 07 92 00: Joint Sealants.

C. Reference Standards:
   1. ASCE:
      a. ASCE 7 Minimum Design Loads for Buildings and Other Structures.
   2. ASTM:
      a. ASTM A653 Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
      b. ASTM A792 Steel Sheet, 55 % Aluminum Zinc Alloy Coated by the Hot Dip Process.
      c. ASTM C1371 Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
      d. ASTM C1549 Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
      e. ASTM D523 Specular Gloss.
      f. ASTM E283 Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
      g. ASTM E331 Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
      h. ASTM E1592 Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
      i. ASTM E1918 Measuring Solar Reflectance of Horizontal and Low Sloped Surfaces in the Field.
      j. ASTM E1980 Calculating Solar Reflectance Index of Horizontal and Low Sloped Opaque Surfaces.
   3. CRRC:
      a. CCRC-1 Test Method #1: Measuring Solar Reflectance of a Flat, Opaque, and Heterogeneous Surface Using a Portable Solar Reflectometer.
   4. SMACNA Architectural Sheet Metal Manual.
   5. UL 580 Standard for Tests for Uplift Resistance of Roof Assemblies.

6. US Environmental Protection Agency: Energy Star Reflective Roof Products.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer's specifications and other data needed for compliance with specified requirements.
   2. Manufacturer's installation instructions.

B. Shop Drawings:
   1. Indicate thickness and dimensions of parts, fastenings, and anchoring methods, details and locations of joints, transitions, and other provisions necessary for thermal expansion and contraction.
   2. Indicate locations of field and factory applied sealant.

C. Samples:
   1. Submit two (2) samples, 12 inches long by full panel width, showing proposed metal thickness and seam profile.
   2. Submit standard color samples of metal for Architect’s selection.

D. Manufacturer Qualifications:
   1. Installer qualifications: Submit list of completed projects, with names and contact information for architects and contractors.

E. Test Reports: Indicating compliance of products with Project requirements.

F. Certifications:
   1. Letter of certification from manufacturer that installer is in compliance and meets specified requirements.
   2. Letter of certification from manufacturer that panels have been produced in accordance with strictest applicable standards to ensure quality.
   3. Certified test results by a recognized testing laboratory or manufacturer’s laboratory (witnessed by a professional engineer) in accordance with specified performance test methods for each panel system.
   4. Manufacturer’s certification that materials are in compliance with the specifications, including but not limited to finish and panel material.
   5. Manufacturer’s affidavit that materials used in Project contain no asbestos.

G. Testing Reports: Showing metal panels have been tested in accordance with specified performance testing requirements.

H. Field Reports: Required for conformance with warranty requirements specified below.

I. Warranty: Manufacturer’s warranty as specified.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Ten (10) years' experience, minimum, in factory fabrication of metal panels.
   2. Manufacturer shall carry two million dollars ($2,000,000.00) liability insurance, minimum, for metal panel system.

B. Installer Qualifications:
   1. Three (3) years' experience, minimum, in application of metal roof or wall panels.
   2. Five (5) satisfactory projects with metal panel work of similar scope and complexity to

work of this Project.

3. Installer must be approved by manufacturer in writing prior to bid. Approval document must be included with Project bid.

C. Testing Agency Qualifications: Agency compliant with ISO/IEC Standard 17025, or an accredited independent agency recognized by the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement or ANSI.

1.5 WARRANTY

A. Manufacturer's Warranty:
1. Manufacturer’s standard 25-year performance warranty, stating the following:
   a. Architectural fluorocarbon finish:
      1) Will be free of fading or color change in excess of five (5) Hunter delta-E units as determined by ASTM D2244.
      2) Will not chalk in excess of numerical rating of eight (8) when measured in accordance with standard procedures specified in ASTM D4214 method D659.
      3) Will not peel, crack, chip, or delaminate.
      4) Metal substrate will not rupture, fail structurally, or perforate.

B. Installer's Warranty:
1. Warrant panels, flashings, sealants, fasteners, and accessories against defective materials and/or workmanship, covering repairs required to maintain roof panels watertight and weatherproof with normal usage for two (2) years following Project Substantial Completion date.
2. Furnish written warranty signed by installer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements:
1. Keep panels and accessory items dry.
2. Protect against damage and discoloration.
3. Handle panels with non-marring slings.
4. Support panels to prevent permanent deformation.
5. Store panels above ground with one end elevated for drainage.
6. Protect panels against standing water and condensation between adjacent surfaces.
7. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and keep sheets separate for air-drying.
8. Painted panels shall be shipped with protective plastic sheeting or a strippable film coating between panels. Remove strippable film coating prior to installation. Do not allow strippable film coating to remain on panels in extreme heat, cold, direct sunlight, or another UV source.
9. Do not allow panels to contact treated lumber.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Specifications are based on named products and manufacturers. Manufacturers listed whose products meet or exceed the specifications are approved for use on the Project. Other manufacturers must have a minimum of ten (10) years’ experience manufacturing products meeting or exceeding the specifications and comply with requirements of Division 01 regarding substitutions to be considered:
1. AEP Span, Fontana, CA; (800) 733-4955.

2. Garland Industries, Inc.; Sacramento, CA (916)865-7753
3. Berridge Manufacturing Co.; Fontana, CA; (800) 669-0009.
4. McElroy Metal Sacramento, CA (800) 950-8448.
5. Metal Sales, Woodland, CA (530)668-5690

B. Products (Basis of Design):
   1. **AEP Span, a Division of ASC Profiles, Inc**.; Design Span

C. Performance Criteria:
   1. Wind uplift:
      a. As required by ASCE 7.
      b. Panel system shall be ASTM E1592 tested under the supervision of an ANSI or ISO/IEC accredited laboratory and the laboratory shall issue the test report.
      c. Select seam narrow batten: UL Construction #397, minimum 24-gauge panels, when installed over minimum 5/8-inch nominal plywood decking, with roof panel fastener clips spaced 24 inches on center maximum.
      d. Deflection limits: Withstand wind loads with deflections no greater than 1/180 of the span.
   2. Air infiltration: <0.02 cfm per linear foot of joint when tested in accordance with ASTM E283 at static test pressure differential of 20.0 psf.
   3. Water penetration under static pressure: No leakage through panel joints when tested in accordance with ASTM E331 at static test pressure differential of 25.0 psf.
   4. Thermal movements:
      a. Accommodate thermal movement without buckling, joint opening, overstressing components, failure of connections, or other detrimental effects, through the following temperature changes:
         1) 120 degrees F, ambient.
         2) 180 degrees F, material surface.
         3) CBC 1505.1 General. Roof assemblies shall be divided into the classes defined in this section.

2.2 MATERIALS

A. Panels:
   1. Select Seam Narrow Batten, AEP Span, a Division of ASC Profiles, Inc.; Preformed Metal Standing Seam Roofing:
      a. Material: Steel conforming to ASTM A792.
      b. 22 Gauge: Yield strength 50,000 psi; with aluminum-zinc alloy coating conforming to ASTM A792, Class AZ50.
      c. Panel width and pattern:
         1) 16-inch panel width, with striated pattern.
         2) Panel rib height: 1 7/8”
         3) Narrow batten cap one-inch high by 3/8-inch wide (1” x 3/8”).
      d. Panel finish: Provide primer and top finish coat on exposed faces; provide primer and backer coat on concealed faces of panels.
      e. DuraTech® 5000: Polyvinylidine fluoride, full 70 percent Kynar 500®or Hylar 5000®, consisting of a baked-on 0.15-0.20 mil corrosion resistant primer and a baked-on 0.70-0.80 mil finish coat with a specular gloss of eight (8) to 15 when tested in accordance with ASTM D523 at 60 degrees.
      f. Panel color: As selected from manufacturer's full range.
      g. Seam sealant: Factory apply high-grade butyl mastic sealant within the confines of narrow batten, designed to seal against adjacent male panel legs.

2.3 ACCESSORIES

A. Trim and Flashing:

1. Material, metal thickness, and finish to match panels. Profiles indicated in Drawings:
   a. Provide manufacturer's standard accessories and other items essential to completeness of standing seam roof installation.

B. Panel Penetration Flashings: As recommended by panel manufacturer; designed to provide sufficient movement to prevent creation of points of fixity at penetrations.

C. Sealant for Field Application: High grade non-curing butyl or curing urethane sealant as recommended by panel manufacturer. Do not use sealant containing asphalt. See Section 07 92 00: Joint Sealants.

D. Bearing Plate: 22-guage minimum. See Metal Construction Association Technical Bulletin "Fastener Selection." Usually retain first option; retain second option if UL Class 90 is required.

E. Fasteners: Manufacturer's standard #10 - by one-inch (1") long self-drilling, pancake head screws for metal; noncorrosive base material.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions, with Installer Present:
   1. Examine conditions and substrates on which metal panels are to be installed. Structural support or substrate shall be flat and plumb to avoid panel stresses and distortion.
   2. Prior to starting work, correct defects.

B. Field Measurements:
   1. Coordinate field measurements and fabrication schedule with construction progress.
   2. Field measure prior to fabrication. Show recorded dimensions on shop drawings, including locations of shop-fabricated openings.
   3. If field measurements differ from Drawing dimensions, notify Architect prior to fabrication.

3.2 PREPARATION

A. Substrate and Underlayment:
   1. Install according to approved shop drawings and metal panel manufacturer's recommendations.

3.3 FABRICATION

A. Fabrication, General:
   1. Unless otherwise shown on Drawings or specified herein, fabricate panels in continuous lengths and fabricate flashings and accessories in longest practical lengths. Contact AEP Span if panel lengths required over 60 feet.

B. Panels:
   1. Provide panels in full length from ridge to eaves when possible.
   2. Where single length panels are not practical, provide mated swaged panels for positive joint end laps, shingled to accommodate water run-off (fabricated with overlap in direction of water flow).

C. Roof panels shall have flush horizontal and vertical surfaces to facilitate sealing at

terminations. Panel configurations that create voids and requiring supplemental closure devices shall not be considered acceptable:

1. Engineer panels to use concealed anchors that permit expansion and contraction, except at eaves, end laps, ridges, valleys, hips, and gables.

D. Fabrication Tolerances:
   1. Flat metal surfaces will display waviness commonly referred to as “oil canning.” This is caused by steel mill tolerances and is a characteristic, not a defect, of panels manufactured from light gauge metal.
   2. Panels are factory correctively-leveled to minimize the occurrence of “oil canning.” As such, “oil canning” will not be accepted as cause for rejection.

3.4 INSTALLATION

A. Panels and Trim:
   1. Comply with manufacturer's instructions for assembly, installation, and erection for weather tight installation:
      a. Install according to approved shop drawings.
      b. Install panels in accordance with manufacturer’s instructions and recommendations. Anchor securely in place using clips and fasteners spaced in accordance with manufacturer’s recommendations for design wind load criteria.
      c. Comply with methods and recommendations of SMACNA Architectural Sheet Metal Manual for flashing configurations required.
      d. Discrepancies between jobsite conditions and shop drawings shall be brought to the attention of the Architect for resolution.
      e. Cutting and fitting:
         1) Cut panels neat, square, and true with shearing action cutters. Torch or power saw cutting is prohibited.
         2) Openings six inches (6”) and larger: Shop fabricate and reinforce to maintain original load capacity.
         3) Openings less than six inches (6”): Field cutting is acceptable.
      f. Dissimilar metals or materials:
         1) Where panel or trim may come in contact with dissimilar metals or treated lumber, fabricate transition to facilitate drainage and minimize possibility of galvanic action. Galvanic action can cause panels and trim to fail prematurely.
         2) At points of contact with dissimilar metal or treated lumber, coat panel and trim with protective paint or separate materials with a weatherproof underlayment.
      g. Direct contact or run-off from CCA, ACQ, CA, or other treated lumber (outdoor wood) or fire retardant impregnated or treated wood shakes or siding can cause panels and trim to fail prematurely. Avoid contact with these materials.

B. Accessories: Install trims, flashings, and roofing specialties according to Drawings and manufacturer's recommended details.

C. Sealant Installation:
   1. Apply according to approved shop drawings and SMACNA Architectural Sheet Metal Manual recommendations:
      a. Provide airtight and waterproof installation.

3.5 CLEANING

A. Repairs:
   1. Touch up paint is not required for panels with scratches that do not expose metal.
   2. Panels or flashings with finish damage exposing metal or with substrate damage shall

be replaced.

B. Cleaning and Waste Management:
   1. See Section 01 50 13: Construction Waste Management and Disposal for recycling requirements:
      a. At completion of each day's work and at work completion, sweep panels, flashings, and gutters clean. Do not allow fasteners, cuttings, filings, or scraps to accumulate.
      b. Clean exposed surfaces of work promptly after completion of installation.

3.6 PROTECTION

A. Protect work as required to ensure that roofing will be without damage at final completion.

END OF SECTION 07 41 13

SECTION 07 42 16 METAL SOFFIT PANELS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes pre-formed metal soffit panels with concealed fasteners, factory finished.

B. Related Sections:
1. Section 07 41 13: Metal Roof Panels.
2. Section 07 62 00: Sheet Metal Flashing and Trim.

C. Reference Standards:
1. American Society for Testing and Materials (ASTM):
   a. B209 Specification for Aluminum and Aluminum – Alloy Sheet and Plate.
2. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
   a. Architectural Sheet Metal Manual, Latest Edition.

1.3 SUBMITTIALS

A. Product Data: Include manufacturer’s detailed material and system description, concealed anchor clips, sealant and closure installation instructions, and finish specifications. Indicate fastener types and spacing and required fastener pullout values.

B. Samples:
1. Provide full-size samples of the following materials and system components. Samples shall be of identical material type, thickness, panel width, and material grade/alloy as the system specified for this Project:
   a. Submit sample of panel section, at least four inches (4”) long by full panel width showing panel profile and also a sample of color selected.
   b. Submit sample of panel fasteners.

C. Provide the following information from the manufacturer:
1. A letter from the manufacturing company certifying that the materials furnished for this Project are the same as represented in tests and supporting data.
2. Manufacturer’s verifications that the panels are factory roll formed.

D. Mill production reports certifying that the steel thicknesses are within allowable tolerances of the nominal or minimum thickness or gauge specified.

E. Test Reports: Submit third party validation of environmental claims, prepared UL Environment, for all metal soffit material containing recycled content and/or bio-based content.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an installer who has completed the manufacturer’s approved contractor course and is currently certified for the installation of the specified system.

B. If required, fabricator/installer shall submit work experience and evidence of adequate financial responsibility. The Owner's representative reserves the right to inspect fabrication facilities in determining qualifications.

C. Source Limitations:
   1. Obtain all components from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the manufacturer:
      a. Upon request of the Architect or Owner, submit manufacturer's written approval of secondary components in list form, signed by an authorized agent of the manufacturer.
      b. Manufacturer shall have direct authority and control over all fabrication of steel components as well as the raw materials used in their fabrication.

D. Engage the manufacturer's field representative to conduct required periodic inspections of work in progress as described herein and furnish written documentation of all such inspections.

E. Manufacturer shall provide the Owner with a written statement that they will provide a site inspection two (2) days per week that confirms that the Project is being constructed as specified, by an experienced, full time employee of the company.

F. Manufacturer's Inspections:
   1. When the Project is in progress, the system manufacturer will provide the following:
      a. Keep the Architect or Owner informed as to the progress and quality of the work as observed.
      b. Provide jobsite inspection two (2) days per week.
      c. Report to the Architect in writing any failure or refusal of the Contract to correct unacceptable practices called to the Contractor's attention.
      d. Confirm after completion that manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.5 WARRANTY

A. Provide a five (5) year workmanship warranty.

B. Provide a manufacturer's 20-year finish warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

A. All panels shall be delivered with appropriate packaging to provide protection against transportation damage. Materials damaged in shipping or storage shall not be used.

B. Store all materials and accessories above ground on well-skidded platforms. Store under waterproof covering. Provide proper ventilation to panels to prevent condensation build up between panels.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Specifications are based on named products and manufacturers. Manufacturers listed whose products meet or exceed the specifications are approved for use on the Project. Other manufacturers must have a minimum of five (5) years' experience manufacturing products meeting or exceeding the specifications and comply with requirements of Division

01 regarding substitutions to be considered:
1. Ralston Metal Soffit Panel (basis of design).
2. AEP-Span, Fontana, CA; (800) 733-4955.
3. Berridge Manufacturing Company; Fontana, CA; (800) 669-0009.
4. McElroy Metal Sacramento, CA (800) 950-8448.

2.2 MATERIALS

A. Soffit Panels:
1. Flush Face Series – 12-inch coverage.
2. Perforated 24-gauge galvalume steel panels.

B. Style:
1. Model – TLC-1 Panel.
2. 1-1/2-inch thick flush panel.

C. Finish: Factory pre-finished with an exterior surface of Kynar 500® or Hylar 5000® based coating having a resin content consisting of at least 70 percent PVDF fluoropolymer resin content, in at least 1.0 mil thickness, in color(s) selected by Owner; interior surface finish, manufacturer's standard.

D. Accessories:
1. Concealed Fasteners: #10-16 by one-inch (1") - Stainless Steel screws supplied or recommended by panel manufacturer to suit application.
2. Provide all necessary accessories, framing and support members, closures, and trim for complete installation of soffit panels.

PART 3 EXECUTION

3.1 COORDINATION

A. Coordinate work with installation of associated metal flashings and trim.

3.2 EXAMINATION

A. Ensure substrates are flat, free from objectionable warp, wave, and buckle, and ready to receive soffit panels.

3.3 INSTALLATION OF SOFFIT PANELS

A. Comply with manufacturer's instructions for assembly, installation, and erection in order to achieve weather tight installation.

B. Install closures and trim to form a complete installation.

3.4 PROTECTION

A. Protect soffit panels from damage and discoloration.

B. Repair damaged or discolored panels.

END OF SECTION 07 42 16

SECTION 07 62 00 SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. It is the intent of this Section that the work shall:
   1. Conform to all applicable DSA and building code requirements.
   2. Include all shop and field formed sheet metal work shown on Drawings, specified, or required, including, but not limited to:
      a. Roof penetration sleeves, collars, hood, and umbrella counterflashing.
      b. Metal counterflashing.
      c. Expansion joint.
      d. Metal perimeter edge.
      e. Gutters, downspouts, splash blocks and splash pans.
      f. One-way roof moisture relief vents.
      g. Metal gravity vents.
      h. Metal heat exhaust vents.
      i. Sanitary vent pipes.
      j. Pipe box.
      k. Copings, trim, and miscellaneous sheet metal accessories.

B. Related Sections:
   1. Section 07 92 00: Joint Sealants.
   2. Division 22: Plumbing.
   3. Division 23: Heating, Ventilating & Air Conditioning (HVAC).

C. Reference Standards:
   1. ASTM International (ASTM):
      a. A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
      b. B32 Standard Specification for Solder Metal.
      c. C1107 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
   2. National Association of Architectural Metal Manufacturers (NAAMM).
   3. National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual.
   4. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) Architectural Sheet Metal Manual.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer’s specifications and other data needed to prove compliance with specified requirements.
   2. Manufacturer’s installation instructions.

B. Shop Drawings: Indicating sizes, configurations, and details of attachment to related and adjacent work, materials, and finishes.

C. Samples:
   1. Full range of finish colors for Architect's selection.
   2. 12-inch long sample of each specified item with approved finish.
   3. Provide full size mockup of all shop built assemblies.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Fabricator and installer of roof related flashing and accessories shall be the same as the membrane roof installer.

B. Comply with governing codes and regulations of authorities having jurisdiction.

C. Installation Conference:
   1. Refer to Section 01 31 19: Project Meetings

1.5 WARRANTY

A. Manufacturer's Product Warranty:
   1. Manufacturer's standard 20-year Kynar 500 or Hylar 5000 finish warranty signed by the manufacturer, with guarantee covering any failure of the fluoropolymer finish during the warranty period.
   2. Failure is defined to include, but is not limited to, deterioration of finish, such as fading, discoloring, peeling, cracking, corroding, etc.
   3. Correction may include repair or replacement of failed product.

B. Roofing Contractor’s Warranty:
   1. Contractor shall warrant the sheet metal work and related work to be free from defects in workmanship and materials, and that the metal flashings will be and remain watertight, for a period of five (5) years from date of Substantial Completion.
   2. Defects shall include, but not be limited to:
      a. Leaking water or bitumen within building or construction.
      b. Becoming loose from substrate.
      c. Loose or missing parts.
      d. Finish failure as defined above.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Handle and store materials and equipment in such a manner as to avoid damage.

C. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day. Any exception must be in written form. Do not place materials or equipment in such a manner as to overload structure.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Manufacturers named within specification are approved for use on the Project providing:
   1. Their products meet or exceed the specifications.
   2. Company has a minimum of five (5) years’ experience manufacturing products of the type specified.
   3. Products have been tested in conjunction with roofing membrane system as an assembly and as such has obtained the same approval and rating as the roofing

membrane system.
4. Products are approved for use by the roofing membrane manufacturer.

B. Substitutions shall be in accordance with Division 01 requirements regarding substitutions.

2.2 SHEET METAL MATERIALS

A. General Requirements: Roofing sheet metal system shall have been tested in conjunction with roofing membrane system as an assembly and have the same approval and rating as the roofing membrane system.

B. Prefinished Aluminum Sheet:
1. Precoated type, aluminum conforming to Fed. Spec. QQ-A-250, ASTM B209.
2. Finish: Kynar 500, color as selected by Architect from manufacturer's standard colors.
3. Thickness: Minimum 0.040 inch, except as otherwise indicated.

C. Sheet Lead: Four (4) pound minimum for use at roof drains and soil stacks.

D. Stainless Steel: Type 302/304 Soft Temper, No. 2D finish. Minimum thickness 24 gauge, except as otherwise noted.

2.3 FASTENERS

A. Same metal as flashing/sheet metal or other noncorrosive metal or as noted below.

B. Exposed fasteners shall be self-sealing and gasketed for weathertight installation (ZAC type).

C. Match finish of exposed heads with material being fastened.

D. Mechanical Fasteners:
1. Nails: Stainless steel ring shank, minimum 1-1/2 inch in length with 1/2-inch diameter head.
2. Washers: Steel washers with bonded rubber sealing gasket.
3. Screws: Self-tapping sheet metal type of stainless steel or compatible with material being fastened, with hooded integral EPDM washers (ZAC type).
4. Rivets: Stainless steel and cadmium plated material, closed end type of sizes recommended by sheet metal manufacturer to suit application.

E. Clips: Continuous cleat (coping/fascia). Minimum 20-gauge, G-90 galvanized, stainless steel, or aluminum. Match material of coping/fascia and provide one (1) gauge heavier.

2.4 RELATED MATERIALS

A. Solder: ASTM B32, alloy grade 58, 50 percent tin, 50 percent lead.

B. Flux:
1. Phosphoric acid type, manufacturer’s standard:
   a. For use with steel or copper: Rosin flux.
   b. For use with stainless steel: Acid-chloride type flux, except use rosin flux over tinned surfaces.

C. Underlayment:
1. 48 mil minimum, non-reinforced, homogeneous, waterproof, impermeable elastomeric sheeting manufactured by Nervastral, Inc. or Lexus Co.

D. Adhesives: Type recommended by flashing sheet manufacturer seaming and adhesive application of flashing sheet to ensure adhesion and watertightness.

E. Metal Accessories: Sheet metal clips, straps, anchoring devices, clamps, and similar accessories required for the complete installation of work, matching or compatible with material being installed, non-corrosive, and size and gauge recommended by installer to suit application and performance.

F. Sealant:
1. Type A:
   a. Type: One-part, non-sag, moisture-curing polyurethane sealant.
   b. Approved products/manufacturers:
      1) Chem-Calk 900, manufactured by Bostik Construction Products Division.
      2) Vulkem 921, manufactured by Mameco International, Inc.
      3) Dynatrol I, manufactured by Pecora Corporation.
      4) NP 1, manufactured by Sonneborn Building Products.
      5) Approved equal.
2. Type B:
   a. Type: One-part, neutral-curing, medium-modulus silicone sealant for sealing metal to metal surfaces, i.e. metal edge, cover plates, etc.
   b. Approved products/manufacturers:
      1) Chem-Calk 1200, manufactured by Bostik Construction Products Division.
      2) 795 Silicone Building Sealant, manufactured by Dow Corning Corporation.
      3) 895 Silicone, manufactured by Pecora Corporation.
      4) Omniseal, manufactured by Sonneborn Building Products
      5) Spectrem 2, manufactured by Tremco Incorporated.
      6) Approved equal.

G. Grout - Pitch Pans:
1. Type: Quick-setting, non-shrink, non-metallic, high strength formula complying with ASTM C1107.
2. Approved products/manufacturers:
   a. Sure Grip High Performance Grout, manufactured by Dayton Superior Corporation.
   b. Premier Quick-Trim, manufactured by L & M Construction Chemicals, Inc.
   c. Masterflow, manufactured by Master Builders, Inc.
   d. Sonnogrout 10K, manufactured by Sonneborn Building Products.
   e. Approved equal.

H. Pitch Pan Filler:
1. Type: Pourable polyurethane sealer, approved by roofing system manufacturer.
2. Approved products/manufacturers:
   a. Quick Pitch Sealer, manufactured by U.S. Intec.
   b. SPM Pourable Sealer, manufactured by Johns Manville.
   c. Approved equal.

I. Termination Bar:
1. Material: Extruded aluminum bar with flat profile.
2. Size: 1/8-inch thick by one-inch (1”) wide with factory punched 1/4-inch by 3/8-inch oval holes spaced six inches (6”) on center.
3. Approved product/manufacturer:
   a. TB 125, manufactured by TruFast Corp.
   b. Approved equal.

J. Splash Blocks: Concrete type, of size and profiles indicated; minimum 3,000 psi compressive strength at 28 days, with minimum five percent (5%) air entrainment. Use at locations where roof drainage dumps on ground.

K. Splash Pans: 22-gauge stainless steel, of size and profiles indicated. Use at locations where roof drainage discharges over adjoining, lower roof level(s).

L. One-Way Moisture Relief Vents: Shall be fabricated from spun aluminum as recommended by roofing manufacturer.

2.5 FABRICATION

A. Except as otherwise indicated, fabricate work in accordance with SMACNA Architectural Sheet Metal Manual and other recognized industry practices and reviewed shop drawings. Form all flashings, receivers, and counterflashings in accordance with standards set forth in the NRCA roofing manual and SMACNA.

B. Comply with manufacturer's installation instructions and recommendations.

C. Unless noted otherwise, fabricate perimeter edge/fascia, scuppers, gutters, downspouts, copings, counterflashings, wind clips, and trim from pre-finished aluminum sheet steel.

D. Shop fabricate work to greatest extent possible. Fabricate inside and outside corners for metal edges, counterflashing, and coping caps of equal length – minimum two-foot (2’) lengths.

E. Fabricate items to size and dimensions as indicated on the Drawings. Limit single-piece lengths to ten feet (10’).

F. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work sufficient to permanently prevent leakage, damage, or deterioration of the work.

G. Integrate flashing in a manner consistent with detailing. Form work to fit substrates.

H. Make angle bends and folds for interlocking metal with full regard for expansion and contraction to avoid buckling or fullness in metal after installation.

I. Fabricate items with straight lines, sharp angles, smooth curves, and true levels. Avoid tool marks, buckling, and oil canning.

J. Fold back edges on concealed side of exposed edge to form hem.

K. Unless noted otherwise, lap joints minimum one inch (1”). Rivet and solder joints on parts that are to be permanently and rigidly assembled.

L. Seams:
1. Wherever possible, fabricate non-moving seams in sheet metal with flat-lock seams and end joints.
2. Pre-finished galvanized steel: Seal pre-finished metal seams with rivets and silicone sealant.
3. Metal other than aluminum: Tin edges to be seamed, form seams, and solder.

M. On Kynar 500 or Hylar 5000 pre-finished metal, surface sand metal flanges prior to applying any primers. Prime all metal in contact with bituminous material.

N. Back-paint all concealed metal surfaces with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals.

O. Expansion Provisions: Where lapped or bayonet type expansion provisions in work cannot be used or would not be sufficiently waterproof or weatherproof, form expansion joints of intermeshing hooked flanges, not less than one-inch (1") deep filled with mastic sealant concealed within joints.

2.6 FABRICATED ITEMS

A. Metal Flashings (Minimum ten-foot [10'] lengths):
   1. Through wall receiver tray: Minimum 24-gauge stainless steel, through wall receivers shall not extend past the face of the exterior veneer more than 3/4 inch.
   2. Counterflashing: Minimum 24-gauge stainless steel.

B. Wind Clips: Minimum 24-gauge stainless steel (or match material of counterflashing), one-inch (1") wide by length to engage counterflashing a minimum of 1/2 inch. To be installed at all wall flashings and at curb flashing lengths longer than five feet (5').

C. Roof Penetrations:
   1. Umbrella counterflashing: Two-piece construction of minimum 24-gauge stainless steel, fabricated in accordance with Drawings or Project requirements.
   2. Pitch pans:
      a. 24-gauge stainless steel.
      b. Fabricate to provide installed minimum clear inside perimeter dimension of two inches (2") on each side of penetrating element.
      c. Fabricate pans to at least six inches (6") above the finished roof membrane and with 1/4-inch hem at top edge and with four-inch (4") flanges. Round all corners of flange.
      d. Fabricate metal bonnets for all pans, no exceptions. Fabricate bonnets with metal compatible with metal to which bonnet is to be attached. On beams and other steel, weld in place bonnets fabricated from 1/4-inch steel plate. Draw band bonnets fabricated from 22-gauge stainless steel may be used on circular projections.

D. Metal Edge:
   1. Minimum 0.040-inch thick pre-finished aluminum formed in maximum ten-foot (10') lengths, with six-inch (6") wide cover plates of same profile, four-inch (4") flange, maximum seven-inch (7") fascia, 3/4-inch gravel stop.
   2. Provide expansion slip joints at maximum 20 feet on center.
   3. Shop fabricate all interior and exterior corners. Fabricate exterior corners with 18-inch minimum to four-foot (4') maximum legs. Lap, rivet, and seal prior to delivery to jobsite.
   4. Fabricate to sizes and dimensions as indicated on Drawings with a minimum one-inch (1") coverage past top of wall. Refer to SMACNA Fig. 2-5A.
   5. Provide mock-up for Architect's approval prior to fabrication.

E. Continuous Cleats: Continuous strips, same material and profile, minimum one (1) gauge heavier of item to which cleats attach.

F. Vent Hoods, Sleeves, Penetration Flashings, and Accessories: Minimum 24-gauge stainless steel, or as shown or directed otherwise.

G. Angle Termination Bar: Aluminum pressure bar 1/8 inch by one inch (1").

H. Vent Pipe Flashing: Four (4) pound lead. Provide proper size to fold down inside of pipe a minimum of one inch (1").

I. Roof Drain Flashing: Four (4) pound lead, minimum 30 inches by 30 inches.

J. Coping:
1. Minimum 0.040-inch thick pre-finished aluminum, with six-inch (6") wide cover plates of same profile.
2. Fabricate as outlined in SMACNA; Refer to Figure 3-4 A.
3. Provide tapered substrate to slope to one (1) side, and cover with waterproof membrane.
4. Install with continuous cleat one (1) side and fasten other side.

K. Gutters/Downspouts/Collector Heads:
1. Gutters and downspouts: Minimum 0.040-inch thick pre-finished aluminum formed in maximum ten-foot (10') lengths, with six-inch (6") wide cover plates. Minimum five-inch by six-inch (5" x 6") box gutter (verify size meets rainfall data per SMACNA).
2. Gutter/downspout straps: Minimum 0.040-inch thick pre-finished (match color) aluminum. Hem both sides.
3. Gutter supports: Minimum 0.040-inch thick pre-finished (match color) aluminum hemmed around 1/8-inch galvanized bent steel bracket.
4. Gutter screen: Stainless steel 1/4-inch diamond wire screen enclosed in a pre-finished frame.
5. Collector heads: Minimum 0.040-inch thick pre-finished (match color) aluminum. As outlined in SMACNA; Refer to Figure 1-25F and Figure 1-28 with alternate Section A-A.

L. Pipe Box Cover: 24-gauge stainless steel.

M. Heat Exhaust Curbs and Hoods: 22-gauge stainless steel.

N. Expansion Joint Cover: Minimum 24-gauge stainless steel (provide pre-finished metal at perimeter edge end termination.)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrates are smooth and clean to extent required to perform sheet metal work.

B. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set in place.

C. Verify that reglets, nailers, cants, and blocking to receive sheet metal are in place and free of concrete and soil.

D. Do not start work until conditions are satisfactory.

3.2 PREPARATION

A. Field measure site conditions prior to fabrication work.

B. Install starter and edge strips and cleats before starting installation.

3.3 INSTALLATION

A. Install sheet metal with lines, arises, and angles sharp and true, and plane surfaces free from objectionable wave, warp, or buckle. Exposed edges of sheet metal shall be folded back to form 1/4-inch hem on concealed side from view. Finished work shall be free from water retention and leakage under all weather conditions. Pre-fabricated corners or

transitions are required at changes in direction, elevation, or plane and at intersections. Locate field joints not less than 12 inches, nor more than three feet (3') from actual corner. Laps shall be one inch (1"), riveted and soldered at following locations:

1. Pre-fabricated corners.
2. Transitions.
3. Changes in direction, elevation, and plane.
4. At intersections.

B. Anchor units of work securely in place to prevent damage or distortion from wind or buckling. Provide for thermal expansion of metal units; conceal fasteners wherever possible; and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight and weatherproof.

C. Install fabricated sheet metal items in accordance with manufacturer's installation instructions and recommendations with SMACNA Architectural Sheet Metal Manual.

D. Separations: Provide for separation of metal from dissimilar metal or corrosive substrates by coating concealed surfaces with zinc chromate, bituminous coating, or other permanent separation at locations of contact as recommended by manufacturer or fabricator. Do not use materials that are incompatible with roofing system.

E. Continuous Cleat: At exposed edges of perimeter edge, fascias, cap flashings, and where required, attach continuous cleat at six inches (6") on center with appropriate fasteners.

F. Gravel Guard/Fascia:
1. Install with expansion joints ten feet (10') o.c., 1/2-inch expansion leeway, with cover plate.
2. Set in asphalt mastic and fasten into nailer at three inches (3") o.c. staggered.
3. Buff sand Kynar surface of flange and prime.
4. Strip in flange with specified stripping plies set in hot bitumen extending three inches (3") from outer edge of flange to at least three inches (3") inward towards gravel stop. Provide finish stripping ply of modified bitumen base ply in hot bitumen extending six inches (6") from the outer edge of the flange and butt base of gravel stop.

G. Counterflashing:
1. Do not use surface mount counterflashing except as noted in Drawings.
2. Set in through wall with receiver and spring lock counterflashing, as detailed in Drawings and to NRCA roofing manual, SMACNA standards.
3. Coordinate installation of through-wall flashing with the masonry contractor.
4. Seal through-wall in conjunction with masonry wall waterproofing.
5. Install wind clips 30 inches o.c. at all counterflashing over five feet (5') in length.

H. Pitch Pans, Metal Flanges:
1. Apply mastic under pitch pan or metal flashing flange at least 1/2 pound per linear foot.
2. Prime all metal flanges with asphalt primer prior to flashing installation.
3. Clean all projections enclosed in pitch pans in any manner suitable and coated with a rust inhibitive coating as approved by the Architect. Coating shall be allowed to dry prior to pitch pan fill.
4. Fill base of pitch pans with grout or cementitious binder and allow to cure.
5. Top Finish Fill: Self-leveling, one-part urethane; at least two inches (2") to top of pitch pan sides.
6. Strip in pitch pan flanges with two (2) strips of specified stripping plies set in hot bitumen extending three inches (3") from the outer edge of the flange to at least three inches (3") inward toward base of pitch pan. Provide finish stripping ply of SBS modified bitumen membrane in hot bitumen extending six inches (6") from the outer edge of the flange and butt to base of pitch pan.

I. Sanitary Vent Stacks:
   1. Prime top and bottom flanges of lead flashing sleeve. Set flange in uniform troweling of plastic roof cement. Prime top side of flange to receive strip-in membrane.
   2. Fold lead sleeve down inside of pipe a minimum of one inch (1”). Apply a continuous bead of sealant on inside of pipe prior to folding lead sleeve.

J. Roof Drains:
   1. After membrane installation, prime bottom of lead flashing sheet and set in uniform bed of plastic roof cement at specified locations.
   2. Extend lead flashing into drain bowl or pipe a minimum of two inches (2”) and over top of piping/bowl connection, if possible. Apply a continuous bead of specified Type A sealant, at intersection of pipe and drain bowl.
   3. If drain bowl and pipe connection is contaminated with bituminous material, strip-in area with three-coursing of plastic roof cement and fabric.
   4. Prime top of lead flashing sheet to receive strip-in membrane.

K. Gutters/Downspouts:
   1. Install gutters as detailed.
   2. Install downspouts plumb and level and attached to columns or wall with straps located at top and bottom of downspout and maximum ten feet (10’) on center.
   3. Install splash pad or block under discharge port of downspouts. Install splash pan over a protection (walkway) pad for downspouts located at roof level.
   4. End caps, downspout outlets, gutter and downspout straps, support brackets, and joint fasteners to be manufactured to suit profile and dimension of gutter and downspout.
   5. Install all anchoring devices as outlined in SMACNA.
   6. Expansion joints: Lap or butt type per SMACNA, locate every 50 linear feet.

L. Expansion Joint:
   1. Construct wood curbs as shown on Drawings and as outlined in the NRCA and SMACNA manuals.
   2. Install underlayment, form envelope, and secure underlayment to curb. Fill envelope with compressible insulation.
   3. Securely fasten expansion joint cover to curb with grommetted fasteners spaced six inches (6”) on center.
   4. Taper expansion joint down at the metal edge.

M. Coping:
   1. Install wood nailers as shown on Drawings.
   2. Install metal cleats with appropriate fasteners spaced six inches (6”) on center.
   3. Install underlayment over the wood substrate. Lap ends minimum of six inches (6”) and secure membrane in place. Seal laps with appropriate adhesive.
   4. Install metal coping allowing 1/2-inch spaces between segments. Lock coping onto cleat and install appropriate fasteners through the interior fascia spaced 24 inches on center in enlarged holes.
   5. Install cover plate centered over coping joint in continuous beads of specified Type B sealant, placed approximately one inch (1”) from cover edges. Refer to SMACNA for alternate joints as required by length.
   6. Install appropriate fastener through neoprene washer and cover plate between coping segments.
   7. Accommodate building wall expansion joints by terminating coping joints and cleats either side of expansion joint. Do not run coping or cleats continuous across joints. Install coping cover plate to span across joint and lap coping on each side of joint a minimum of four inches (4”). Fasten cover plate on one (1) side of joint only (provide wall flashing membrane up and over parapet wall in accordance with manufacturer’s detail).

3.4 CLEANING AND PROTECTION

A. Remove flux and residual acid immediately by neutralizing with baking soda and washing with clean water. Leave work clean of stains.

B. Remove scraps and debris and leave work area clean.

C. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes. Paint areas where finish is damaged on pre-finished metal by painting with a compatible paint in color to match undamaged finish.

D. Prime soldered area of phosphatized metal after cleaning to prevent rusting.

E. Paint metal flashings that have been soiled with bitumen with aluminized paint.

F. Clean other work damaged or soiled by work of this Section.

G. Protect finished work from damage.

END OF SECTION 07 62 00

SECTION 07 92 00 JOINT SEALANTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Control and expansion joints on exposed interior and exterior surfaces.
   2. Perimeter joints between wall surfaces and frames of interior and exterior doors and openings.
   3. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   4. Joints indicated or as necessary.
   5. Accessories necessary for a complete installation.

B. Related Sections:
   1. Section 03 30 00: Cast-In-Place Concrete
   2. Section 07 41 13: Metal Roof Panels
   3. Section 08 11 13: Hollow Metal Doors and Frames.
   4. Section 08 80 00: Glazing.
   5. Section 09 90 00: Painting and Coating.

1.3 SUBMITTALS

A. Product Data:
   1. Technical data for each joint sealant product. Data to indicate elasticity and durability of each joint sealant product. Submit written certification from manufacturers of sealants attesting products are suitable for use indicated, verified through in-house testing laboratory:
      a. Written certification from manufacturers of joint sealants attesting that products comply with specification requirements and suitable for use indicated verified through manufacturers testing laboratory within the past 36 months or since most recent reformulation, whichever is most recent:
         1) Complete instructions for handling, storage, mixing, priming, installation, curing, and protection of each type of sealant.
         2) Manufacturer's letter, clearly indicating proposed lot numbers of each sealant supplied and expiration date sequence.
   2. Recycled Content:
      a. Indicate recycled content; indicate percentage of pre-consumer and postconsumer recycled content per unit of product.
      b. Indicate relative dollar value of recycled content product to total dollar value of product included in Project.
      c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
      d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
   3. Local/regional materials:
      a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the Project site.
      b. Manufacturing location(s): Indicate location of manufacturing facility; indicate

distance between manufacturing facility and the Project site.
c. Product value: Indicate dollar value of product containing local/regional materials; include materials cost only.
d. Product component(s) value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

4. VOC data: Submit manufacturer's product data for sealants. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
5. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

B. Samples:
1. Provide color samples from full manufacturer's full range for each type of sealant specified for Architect's review.

C. Certificates and Reports:
1. Product Certificates: Manufacturer's product certificate for each kind of joint sealant and accessory.
2. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
3. Product test reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
4. Preconstruction compatibility and adhesion test reports:
a. From sealant manufacturer, indicating the following:
1) Materials forming joint substrates and sealant backings have been tested for compatibility and adhesion with sealants.
2) Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
5. Preconstruction field adhesion test reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified.
6. Field adhesion test reports: For each sealant application tested.

1.4 QUALITY ASSURANCE

A. Installer Qualifications:
1. Firm having minimum five (5) years' documented experience and specializes in the installation of sealants:
a. Exposed sealant work (sealants used for air and weatherseals external at perimeter, metal panel to panel joints) shall be performed by a single (i.e. one) firm specializing in the installation of sealants who has successfully produced work comparable to Project.
b. Concealed sealant work (sealants that are internal to skylights and providing an air seal) shall be the responsibility of the subcontractor providing erection of the respective system.

B. Source Limitations: Obtain each type of joint sealant from a single manufacturer.

C. Product Testing:
1. Test joint sealants using a qualified testing agency:
a. Testing agency qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.
b. Test according to SWRI Sealant Validation Program for compliance with requirements specified by reference to ASTM C920 for adhesion and cohesion under cyclic movement, adhesion in peel, and indentation hardness.

D. Environmental Requirements:
   1. Toxicity/IEQ:
      a. Comply with applicable regulations regarding toxic and hazardous materials:
         1) VOC content of interior sealants - sealants and sealant primers complying with limits for VOC content for SCAQMD when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
            a) Sealants: 250 g/L.
            b) Sealant primers for nonporous substrates: 250 g/L.
            c) Sealant primers for porous substrates: 775 g/L.
      b. Sealants containing aromatic solvents, fibrous talc, formaldehyde, halogenated solvents, mercury, lead, cadmium, chromium and their compounds, are not permitted.

1.5 WARRANTY

A. Written warranty, signed by installer agreeing to repair or replace elastomeric joint sealant work that has failed to provide a weathertight system within specified warranty period:
   1. Warranty period: Five (5) years from date of Substantial Completion.

B. Written warranties (weatherseal and stain resistance), signed by sealant manufacturer agreeing to furnish joint sealants to repair or replace those that fail to provide airtight and watertight joints, or fail in adhesion, cohesion, abrasion resistance, stain resistance, weather resistance, durability, or appear to deteriorate in manner not specified in the manufacturer's data as an inherent quality of the material within specified warranty period:
   1. Warranty period: Five (5) years from date of Substantial Completion.

C. Warranties specified exclude deterioration or failure of sealants from:
   1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
   2. Disintegration of joint substrates from natural causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to 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 deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

PART 2 PRODUCTS

2.1 MATERIALS

A. Compatibility: Provide joint sealants, backings, and related materials compatible with one another and with joint substrates under conditions of service and application, as stated by sealant manufacturer’s published data, and as substantiated by the manufacturer for each application through testing.

B. Liquid Applied Sealants: Comply with ASTM C920 and requirements indicated for each

liquid applied sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.

C. Stain Test Response Characteristics: For sealants in contact with porous substrates, provide nonstaining products that have undergone testing according to ASTM C1248 and do not stain porous joint substrates.

D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

E. Colors: For fully concealed joints, provide standard color of sealant that has the best overall performance characteristics for the application shown. For exposed joints, submit color samples to Architect for approval, from manufacturer's full line of standard colors.

F. Manufacturer's Representative: Use sealant produced by manufacturer who agrees to send a qualified technical representative to site upon request for the purpose of rendering advice concerning the recommended installation of manufacturer's materials.

G. Sealants: Self-leveling compounds for horizontal joints in pavements and non-sag compounds elsewhere except as shown or specified.

H. Silicone Sealant:
1. Comply with ASTM C920, Type M, Grade NS, Class 25; use NT, M, A and O:
   a. Use: Typical joints between masonry, metals, glass, and plastics (two-part silicone sealants).
   b. Properties:
      1) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates. The minimum pli value after seven (7) day immersion shall not be less than 13 when tested in strict accordance with ASTM C794 Adhesion and Peel.
      2) Cure system and oil content: Neutral cure system specifically manufactured with controlled oil content to eliminate oil migration into sealed substrates and residue rundown over and onto adjacent substrates.
   c. Product and manufacturer: Dow Corning; 756 Silicone Building Sealant - HP with Additive.

I. Silicone Sealant:
1. ASTM C920, Type S, Grade NS, Class 50, for Use NT:
   a. Use: Typical joints between masonry, metals, glass, and plastics (single component sealants).
   b. Properties:
      1) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates.
      2) Cure system and oil content: Neutral cure system specifically manufactured with controlled oil content to eliminate oil migration into sealed substrates and residue rundown over and onto adjacent substrates.
   c. Product and manufacturer:
      1) BASF Building Systems; Omniseal 50.
      2) Dow Corning Corporation; 756 SMS, 791, 795, 995 as applicable.
      3) GE Advanced Materials, Silicones; SilGlaze II SCS2800, SilPruf NB SCS9000, SilPruf SCS2000, or UltraPruf II SCS2900 as applicable.
      4) Pecora Corporation, as applicable.
      5) Sika Corporation, Construction Products Division; SikaSil-C995.
      6) Tremco, as applicable.
      7) Comparable product.

J. Polyurethane Sealants:
   1. ASTM C920, Type M, Grade NS, Class 25; use NT, M, A and O:
      a. Use: Typical Wall and floor joints (two-part polyurethane sealants). Use at concrete joints.
      b. Properties:
         1) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates.
      c. Products and manufacturers:
         1) BASF Building Systems; Sonolastic NP-2.
         2) Pecora Corporation; Dynatred.
         3) Sika Corporation, Construction Products Division; Sikaflex 2c NS or Sikaflex 2c NS TG as applicable.
         4) Tremco, as applicable.
         5) Comparable product.

K. Two-Part Polyurethane Sealants:
   1. ASTM C920, Type M, Grade NS, Class 50; use NT, M, A and O:
      a. Use: Typical Wall and floor joints (two-part polyurethane sealants).
      b. Properties:
         1) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates. The minimum pli value after seven (7) day immersion shall not be less than 13 when tested in strict accordance with ASTM C794 Adhesion in Peel.
      c. Products and manufacturers:
         1) BASF Construction Chemicals; NP 2.
         2) Pecora Corporation, as applicable.
         3) Schnee-Morehead, Inc.; Permathane SM 7200.
         4) Sika Corporation, Inc.; Sikaflex - 2c NS TG.
         5) Tremco, as applicable.
         6) Comparable product.

L. Mildew Resistant Silicone Sealant:
   1. ASTM C920, Type S, Grade NS, Class 25, Use NT, Substrate uses G, A, and O; and containing fungicide for mildew resistance; acid curing:
      a. Use: One-part mildew-resistant silicone, formulated with fungicide for sealing interior joints of nonporous substrates around ceramic tile, plumbing fixtures, and showers.
      b. Products - provide one of the following:
         1) BASF Building Systems; Omniplus.
         2) Dow Corning; 786 Mildew Resistant Silicone Sealant.
         3) GE Silicones; Sanitary SCS 1700.
         4) Pecora Corporation, as applicable.
         5) Sika Corporation, Inc., as applicable.
         6) Tremco, as applicable.
         7) Comparable product.

M. Latex Sealant:
   1. Non-elastomeric, one-part, non-sag, paintable latex sealant that is recommended for exposed applications on the interior. Complying with ASTM C834, Type OP (opaque sealants):
      a. Products are subject to compliance with requirements; provide one of the following:
         1) BASF; Sonolastic Sonolac.
         2) Pecora Corporation; AC-20 + Silicone.
         3) Sika Corporation, Inc., as applicable.
         4) Tremco, as applicable.
         5) Comparable product.

N. Acoustical Joint Sealant:
   1. Non-sag, paintable, non-staining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90:
      a. Products are subject to compliance with requirements; provide one of the following:
         1) BASF, as applicable.
         2) Pecora Corporation; AC-20 FTR or AIS-919.
         3) Sika Corporation, Inc., as applicable.
         4) Tremco, as applicable.
         5) USG Corporation; SHEETROCK Acoustical Sealant.
         6) Comparable product.

O. Sealant Backing:
   1. Provide sealant backings that are non-staining, compatible with joint substrates, sealants, primers, and joint fillers, and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing:
      a. Cylindrical sealant backings: Preformed, compressible, resilient, non-staining, non-waxing, non-extruding backings of flexible plastic foam complying with ASTM C1330, and of type indicated below. Select shape and density of cylindrical sealant backings in consultation with the manufacturer for proper performance in specific condition of use in each case.
      b. Type C - closed cell polyethylene foam material with surface skin, nonabsorbent to liquid water and gas, non-outgassing in unruptured state; provide one of the following:
         1) BASF, as applicable.
         2) HBR Closed Cell Backer Rod; Nomaco, Inc.
         3) Pecora Corporation, as applicable.
         4) Sonolastic Closed-Cell Backer-Rod; BASF Construction Chemicals.
         5) Tremco, as applicable.
         6) Comparable product.

P. Window Glazing:
   1. Product Description: Ready to use glazing compound that may be used for face glazing wood or metal sash on existing windows. It is a knife-grade consistency allows for smooth, easy applications. Stick tightly to glass and sash and resists sagging, shrinking and cracking. Follow manufacturers suggested uses.
   2. This product is NOT to be used on plastic windowpanes, porcelainized steel insulating panels or any insulated glass units with organic seals, stained or leaded glass. Any window pain over 48 inches in any direction.
   3. Listed manufacturer:
      a. Dap 33 Glazing compound.
      b. Approved equal.

Q. Miscellaneous Materials:
   1. Primer: Material recommended, as verified through compatibility and adhesion testing, by joint sealant manufacturer for the substrates indicated to be sealed.
   2. 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.
   3. Masking tape: Non-staining, non-absorbent material compatible with joint sealants and that will not stain nor mar the finish of surface adjacent to joints to which it is applied.
   4. Cork joint filler: Resilient and non-extruding, ASTM D1752, Type II.
   5. Bond breaker tape: Polyethylene, TFE fluorocarbon, or 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.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Limitations:
   1. Do not proceed with installation of joint sealants under the following conditions:
      a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F (4.4 degrees C).
      b. When joint substrates are wet. Should joints or backing materials become wet, remove and replace backing material with new.

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.

3.2 EXAMINATION

A. Examine joints indicated to receive joint sealants for compliance with requirements for joint configuration, installation tolerances, and conditions affecting sealant performance. Proceed with installation after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Surface Cleaning of Joints:
   1. Clean out joints immediately before installing joint sealants to comply with the recommendations of joint sealant manufacturer and requirements:
      a. Remove foreign material from joint substrates interfering with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), existing joint sealants, oil, grease, water, surface dirt, and frost.
      b. Clean concrete, masonry, unglazed surfaces of tile, and similar 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.
      c. Remove laitance and form-release agents from concrete.
      d. Clean metal, glass, porcelain enamel, glazed surfaces of tile, and other 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.

B. Joint Priming (Elastomeric Sealants Only): Prime joint substrates where recommended in writing by joint sealant manufacturer, based on prior testing and 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.

3.4 INSTALLATION

A. Silicone Glazing Sealants: Refer to Section 08 80 00: Glazing.

B. Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

C. Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants applicable to materials, applications, and conditions indicated.

D. Sealant Backings:
   1. Install sealant backings to support sealants during application and at position necessary to produce cross sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability:
      a. Do not leave gaps between ends of sealant backings. Trim for tight fit around obstructions or elements penetrating the joint.
      b. Do not stretch, twist, puncture, or tear sealant backings.
      c. Remove absorbent sealant backings that become wet before sealant application and replace with dry sealant backings.
      d. Install bond breaker tape behind sealants where backings are not used between sealants and back of joints.

E. Weeps and Vents: Install weeps and vents into joints at the same time sealants are being installed. Locate weeps and vents spaced recommended by sealant manufacturer and the window and curtain wall fabricator and erector. Do not install weeps and vents at outside building corners. Do not install vents at horizontal joints immediately below shelf angles, sills, and through wall flashings.

F. Sealants:
   1. Install sealants by proven techniques resulting in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at same time sealant backings are installed:
      a. Apply sealants in depth in accordance with manufacturer's recommendations and recommended general proportions and limitations.
      b. Apply elastomeric sealants, in joints not subject to traffic or abrasion, to a depth equal to 50 percent of the joint width, but not less than 1/4 inch (6 mm) and not more than 1/2 inch (13 mm).
      c. Apply non-elastomeric sealants to a depth approximately equal to the joint width.

G. Tooling of Non-Sag Sealants:
   1. Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform, beads to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces. Tool exposed surfaces of sealants to the profile shown, or if none is shown, tool slightly concave:
      a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
      b. Provide a slight wash on horizontal joints where horizontal and vertical surfaces meet.
      c. Against rough surfaces or in joints of uneven widths avoid the appearance of excess sealant or compound by locating the compound or sealant well back into joint wherever possible.

H. Installation of Preformed Silicone Sealant System:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

I. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.

J. Acoustical Sealant Installation: At sound rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer written recommendations.

3.5 FIELD QUALITY CONTROL

A. Field Adhesion Testing:
   1. Field test exterior wall joint sealant adhesion to joint substrates:
      a. Extent of testing - test completed and cured sealant joints:
         1) Perform ten (10) tests for the first 1,000 feet (300 m) of joint length for each kind of sealant and joint substrate.
         2) Perform one (1) test for each 1,000 feet (300 m) of joint length thereafter or one (1) test per each floor per elevation.
   2. Test method: Test joint sealants according to Method A, Field Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
   3. Inspect tested joints and report on the following:
      a. Whether sealants filled joint cavities and are free of voids.
      b. Whether sealant dimensions and configurations comply with specified requirements.
      c. Whether sealants in joints connected to pulled out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer field adhesion hand pull test criteria.
   4. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
   5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure original sealant surfaces are clean and new sealant contacts original sealant.

B. Evaluation of Field Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with indicated requirements will be considered satisfactory.

Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.6 SITE ENVIRONMENTAL PROCEDURES

A. Indoor Air Quality: Provide temporary ventilation during work. Coordinate interior application of sealants with interior finishes schedule.

3.7 CLEANING AND PROTECTION

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

B. Protect joint sealants during and after curing from contact with contaminating substances and from damage so sealants are without deterioration or damage at time of Substantial Completion. If, despite 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.

END OF SECTION 07 92 00

SECTION 08 11 13 HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 RELATED DOCULENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide items shown on the Drawings and specified, including, but not limited to the following:
   1. Standard and fire rated steel doors.
   2. Steel frames for doors, sidelites, transoms, and windows.
   3. Louvers and vision lites in steel doors, if shown or required.
   4. Sound rated steel doors.
   5. Thermally rated steel doors.

B. Related Sections:
   1. Section 07 92 00: Joint Sealants.
   2. Section 08 80 00: Glazing.
   3. Section 09 21 16: Gypsum Board Assemblies.
   4. Section 09 90 00: Painting and Coating.

C. Reference Standards:
   1. ASTM International (ASTM)
      a. A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
      b. A924 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
      c. A1008 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
      d. A1011 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
      e. C1363 Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
      f. E283 Standard Test Method for Determining the rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
      g. E413 Standard Classification for Rating Sound Insulation.
   2. Hollow Metal Manufacturers Association (HMMA):
      a. HMMA 802 Manufacturing of Hollow Metal Doors and Frames.
      b. HMMA 810 Hollow Metal Doors.
      c. HMMA 830 Hardware Preparation and Locations for Hollow Metal Doors and Frames.
      d. HMMA 840 Installation and Storage of Hollow Metal Doors and Frames.
      e. HMMA 850 Fire Rated Hollow Metal Doors & Frames.
      f. HMMA 890 Technical Summary of Hollow Metal by HMMA.
   3. National Fire Protection Association (NFPA):
      a. 80 Fire Doors and Fire Windows.
      b. 252 Fire Tests of Door Assemblies.
   4. Steel Door Institute – Current Standards: Technical Data Series.

5. Underwriters Laboratories Inc. (UL):
   a. Building Materials Directory.
   b. Listing and Labeling.
   c. 10B and 10C Fire Tests of Door Assemblies.
   d. 1784 Air Leakage Tests of Door Assemblies.
6. Intertek Testing, Services (Warnock Hersey, Inc. (WHI): Listing and Labeling.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer's standard details and catalog data demonstrating compliance with specifications and referenced standards.
   2. Manufacturer's installation instructions.

B. Shop Drawings:
   1. Indicate complete schedule in detail for each steel door and frame using the same reference number for details and openings as those on the contract Drawings. If any door is not by the steel door manufacturer, only the door opening number should be shown along with the type of door (wood, plastic laminate faced, etc.):
      a. Show details of construction, installation, connections, anchors, hardware reinforcement, hardware preparation, louvers, and floor and threshold clearances.

C. Samples are required from non-Steel Door Institute members:
   1. 12-inch by 12-inch sample of a fire-rated and non-rated door, cut from corner of door, showing door construction.
   2. 12-inch by 12-inch sample of each type of door louver specified or required, showing louver construction.
   3. Six-inch (6”) long sample of a fire-rated, non-rated frame, and each type of glass stop specified or required, showing corner and construction.

D. Certificates: Manufacturer’s certification that oversized openings are in compliance with specifications.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: If other than a manufacturer listed under Paragraph 2.1 is proposed for use on the Project, it shall be a company specializing in the manufacturer of steel doors and frames of the type specified for this Project with a minimum of five (5) years’ experience.

B. All steel doors and frames shall be by a single manufacturer, shop drawings to be submitted with manufacturer’s insignia, which is being supplied.

C. Furnish steel doors and frames to meet current ANSI/Steel Door Standards.

D. ANSI A250.13 Testing and Rating of Sever Windstorm Resistant Components for Swing Door Assemblies.

E. ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

F. Comply with ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

G. Regulatory Requirements:
   1. Fire-Rated Assemblies:
      a. Fire-rated door, panel, frame, and fire window construction shall conform to NFPA 252, or UL 10B, as applicable, and acceptable to the code of authorities having jurisdiction.
      b. Fire-rated door construction:
         1) Notwithstanding any other requirements of this Section, provide gauge of metal, method of construction, hardware preparation, reinforcement, and placement, glass opening size, and other specifics required to obtain the specified or required label. The label shall contain the fire resistance rating (20-minute, 45-minute, 1-hour, 1-1/2-hour, 3-hour, etc.) and the designation (A, B, C, D, or E); doors with B Label shall be 1-1/2 hour.
         2) Fire-rated doors used in a stairway enclosure, shall be so constructed so that the maximum transmitted temperature shall not exceed 450 degrees F above ambient temperature at the end of 30 minutes of the Standard Fire Exposure Test and shall be so noted on the label.
      c. Fire-rated openings:
         1) Conform to NFPA 80 for fire-rated class shown or required by code of authorities having jurisdiction:
            a) Units shall be identical to assemblies whose fire resistance characteristics have been determined in accordance with requirements specified above, and shall be labeled and listed by UL, WHI, or other inspection and testing agency acceptable to the code of authorities having jurisdiction.
            b) Fire-rated steel doors, panels, frames, and fire windows shall bear permanent labels attesting to fire resistance. At stairway enclosures, provide units listed for 450 degree F maximum temperature rise rating for 30 minutes of exposure.
            c) Oversized openings shall be constructed in accordance with all applicable requirements for labeled door construction.
            d) Fire rated door assemblies with gaps in excess of 1/8 inch between door and frame will not comply with NFPA 80.
            e) Locate label on hinge side of doors and frames so that when door is closed, label is not visible.
            f) Caution shall be taken to ensure that labels are not removed, damaged, or painted over.
            g) Glass panes shall not exceed sizes allowed whether indicated or not on the Drawings.

H. Wind Loads: Provide hollow metal and door hardware assemblies approved by DSA, including anchorage, capable of withstanding wind load design pressures that are calculated for this Project by a registered Architect or Engineer and is part of the construction documents per CBC.

I. Hurricane-Resistance Test Performance:
   1. Provide hollow metal and door hardware approved assemblies that pass large missile-impact tests, as required by authorities having jurisdiction:
      a. Impact resistance: Hollow metal with approved door hardware assemblies must satisfy Division of the State Architect and CBC for protection from windborne debris. The assemblies must have passed the large missile impact test, which equates to Missile Level D specified in ASTM E1996. The assemblies may be installed at any height on the structure as long as the design pressure rating for the assemblies is not exceeded. These assemblies will and do not need to be protected with an impact protective system when installed in areas where windborne debris protection is required.

J. Accessibility Requirements:
   1. Comply with applicable requirements:
      a. Americans with Disability Act of 1990, as amended: 2010 ADA Standards.
      b. 2022 California Building Code (CBC). CCR Title 24, Part 2, as adopted and amended by DSA.

K. Pre-Installation Conference: Refer to Section 01 31 00: Project Management and Coordination.

1.5 WARRANTY

A. Warrant the work specified herein for one (1) year against becoming unserviceable or causing an objectionable appearance resulting from either defective or non-conforming materials and workmanship.

B. Defects shall include, but not be limited to:
   1. Use of incorrect materials in opening.
   2. Incorrect labeled components installed within opening.
   3. Noisy, rough, or difficult operation.
   4. Failure to meet specified quality assurance requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in accordance with manufacturer’s instructions, and as follows:
   1. In manufacturer's original, clearly labeled, undamaged containers or wrappers.
   2. Containers or wrappers shall list the name of the manufacturer and product.

B. Deliver materials to allow for minimum storage time at the Project site. Coordinate delivery with the scheduled time of installation.

C. Protect products from moisture, construction traffic, and damage:
   1. Store under cover in a clean, dry place, protected from weather and abuse.
   2. Store in a manner that will prevent rust or damage.
   3. Store doors in a vertical position, spaced with blocking to permit air circulation.
   4. Do not use non-vented plastic or canvas shelters.
   5. Should containers or wrappers become wet, remove immediately.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers listed below whose products meet or exceed the specifications are approved for use on the Project. Other manufacturers must comply with Manufacturer Qualifications, must manufacture equivalent products to those specified, and comply with requirements of Section 01 25 00: Substitution Procedures and Form, regarding substitutions to be considered:
   1. CECO Door Products, Brentwood, TN; (615) 661-5030.
   2. Curries Company, Mason City, IA; (515) 423-1334.
   3. Pioneer Industries, Inc., Kewanee, IL; (309) 856-6000.
   4. Republic Builders Products Company, McKenzie, TN; (800) 733-3667.
   5. Steelcraft Mfg. Co., Cincinnati, OH; (513) 745-6400.
   6. Stiles Co.
   7. Approved equal.

2.2 MATERIALS, GENERAL

A. Steel requirements, all frames to be manufactured of commercial quality, stretcher leveled flatness, cold rolled steel per ASTM A1008 general requirements. Internal reinforcing may be manufactured of hot rolled pickled and oiled steel per ASTM A1011. Exterior frames and interior frames where shown on approved Drawings or required in damp, moist, humid, and wet areas, i.e., toilets, locker rooms, showers, etc., to be manufactured of commercial quality, stretcher leveled flatness, cold rolled steel and galvannealed to A-60 minimum coating weight standard per ASTM A653 and A924, with coating weight of not less than 0.60 ounce per square foot (0.30 ounce per square foot per side).

2.3 FRAME FABRICATION

A. Minimum Gauges:
   1. Interior openings:
      a. Less than four feet (4') width: 16 gauge.
      b. Four feet (4') in width and greater: 14 gauge.
   2. Exterior openings: 14 gauge

B. Design and Construction:
   1. Frames shall be custom made, welded units with integral trim of sizes and shapes shown on approved shop drawings. Hinge jambs that butt adjacent 100-degree walls shall have at least four-inch (4") wide frame face to assure the door trim will not strike the wall prior to the door opening at least 100 degrees. Frame profile shall match wall thickness where practical, i.e., 4-3/4-inch at four-inch (4") CMU, 6-3/4-inch at six-inch (6") CMU, and 8-3/4-inch at eight-inch (8") CMU. At masonry wall openings, fabricate frames to suite masonry opening with two-inch (2") head member.
   2. Frames shall be strong and rigid, neat in appearance, square, true, and free of defects, warp, and buckle. Molded members shall be clean cut, straight, and of uniform profile throughout their length.
   3. Jamb depths, trim, profile, and backbends shall be as shown on approved shop drawings.
   4. Corner joints, including face and inside corners, shall have contact edges closed tight, with trim faces mitered and continuously welded, and stops butted. The use of gussets shall not be permitted. Face of frame shall be ground smooth. Knockdown (KD) frames are not permitted.
   5. Minimum depth of stops shall be 5/8 inch, except at fire windows where minimum depth of stops shall be 3/4 inch.
   6. Frames for multiple openings shall have mullion and rail members that are closed tubular shapes having no visible seams or joints. Joints between faces of abutting members shall be securely welded and finished smooth. Mullions shall be key locked removable type. Keys shall be master keyed to Owner's Best system.
   7. High frequency hinge reinforcement: Provide high frequency hinge reinforcements at door openings 48-inch and wider with mortise/butt type hinges only at top hinge location to deter against hinge reinforcement sag.
   8. Continuous hinge reinforcement: Provide welded continuous 12-gage strap for continuous hinges specified in hardware sets in Division 08 Openings.
   9. Provide countersunk flat or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops; provide security head screws at exterior locations.
   10. Provide A60 galvannealed coating at frames in restrooms and locker rooms with showers/Jacuzzi, clean areas such as kitchen rooms.
   11. Electrical knock out boxes:
      a. Factory weld 18-gage electrical knock out boxes to frame for electrical hardware preps; included but not limited to electric thru wire hinges, electrical raceways, door position switches, electric strikes, jamb mount card readers, and magnetic

licks as noted in door hardware sets in Division 08 Openings:
1) Electrical knock out boxes are required at door position switches, electric strikes, card readers, and middle hinge locations.
2) Provide electrical knock out boxes with 3/4-inch knockouts.
3) Conduit to be coordinated and installed in field from middle hinge box and strike box to door position box.
4) Electrical knock out boxes to comply with NFPA requirements and fit electrical door hardware as specified in hardware sets in Division 08 Openings.
5) Electrical knock out boxes for continuous hinges should be located in the center of the vertical dimension on the hinge jamb.
6) Provide field installed conduit per Division 28: Electronic Safety & Security Section for standardized plug connectors to accommodate up to twelve (12) wires as required for electrified door hardware specified in hardware sets in Division 08 Openings. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Wire nut connections are not acceptable.

12. Hardware reinforcements:
    a. Frames shall be mortised, reinforced, drilled, and tapped at factory for fully template mortised hardware in accordance with approved hardware schedule and templates provided by Section 08 71 00: Door Hardware. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates only.
    b. Minimum thickness of hardware reinforcing plates shall be as follows:
        1) Hinge and pivot reinforcements (1-1/4-inch x 10-inch minimum size): Seven (7) gauge.
        2) Strike reinforcements: 12-gauge stiffeners.
        3) Flush bolt reinforcements: 12-gauge.
        4) Closer reinforcements: 12-gauge.
        5) Reinforcements for surface-mounted hardware, hold-open arms, and surface panic devices: 12-gauge.
13. Floor anchors: Minimum 14-gauge, securely welded inside each jamb, with holes for floor anchorage.
14. Jamb anchors:
    a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the T-strap type. Anchors shall be not less than 16-gauge steel. The number of anchors provided at each jamb shall be as follows:
        1) Frames up to seven-feet-six-inches (7’-6”) in height: Three (3) anchors.
        2) Frames seven-feet-six-inches (7’-6”) to eight feet (8’) in height: Four (4) anchors.
        3) Frames over eight feet (8’) in height: One (1) anchor for each two feet (2’) or fraction thereof in height.
    b. Frames for installation in wood or metal stud partitions shall be provided with steel anchors of suitable approved design, not less than 16-gauge thickness, securely welded inside each jamb as follows:
        1) Frames up to seven feet six inches (7’-6”) in height: Four (4) anchors.
        2) Frames seven feet six inches (7’-6”) to eight feet (8’) in height: Five (5) anchors.
        3) Frames over eight feet (8’) in height: Four (4) anchors plus one (1) additional for each two feet (2’) or fraction thereof over eight feet (8’).
    c. Frames to be anchored to previously placed concrete, masonry, or structural steel shall be provided with anchors of suitable design as shown on approved shop drawings.
15. Dust cover boxes: Shall be of not less than 26-gauge steel and shall be provided at all mortised hardware items. Eight-inch (8”) CMU walls with face brick shall have dual offset jamb anchors.
16. Steel spreader: Shall be provided on all frames, temporarily attached to bottoms of both

jambs for bracing during shipping and handling.

17. Loose glazing stops: Shall be of cold rolled steel, not less than 20 gauge, butted at corner joints and secured to the frame with countersunk cadmium or zinc-plated screws. Loose stops at exterior frames shall be placed on the interior side of the frames.
18. Unless otherwise noted on Drawings, ALL doors coat inside of frame profile with corrosion resistant coating to minimum thickness of 1/16 inch.

C. Frame Color: Field painted under Section 09 90 00: Painting and Coating to match face of door unless otherwise indicated on drawings.

2.4 DOOR FABRICATION

A. Minimum Gauges
   1. Interior doors: 0.047 inch or 18 gauge (16 gauge for high frequency doors).Exterior doors: 0.059 inch or 16 gauge (14 gauge for windstorm rated doors).Design and Construction:
   2. Types: Doors shall be custom fabricated, of types and sizes shown on approved shop drawings, and shall be seamless face construction with no visible seams or joints on vertical edges with fully welded seams free from blemishes and defects. Thickness shall be 1-3/4 inch, unless specifically noted or shown otherwise. Exterior doors: Provide doors with 22-gage steel z-channels placed at six inches (6”) apart with foamed in place polyurethane core, with a thermal insulation calculated R factor of 11.01 per ASTM C518 Standards.
   3. Fabrication:
      a. Doors shall be strong, rigid, and neat in appearance, free from warpage and buckle.
      b. Corner bends shall be true and straight and of minimum radius for gage of metal used.
      c. Provide stiffeners with polystyrene core spaced maximum six inches (6”) on center and extending full height of door.
      d. Fill interior with noncombustible fiberglass insulation. Use mineral board filler as required for labeled doors.
      e. Faces shall be joined at vertical edges of door by a continuous weld extending full height of door. Welds shall be ground, filled, and dressed smooth to provide a smooth flush surface.
      f. Top and bottom edges of doors shall be closed with a continuous recessed steel channel not less than 16 gauge, extending full width of door and spot weld to both faces. Exterior doors shall have an additional flush closing channel at top and bottom edges. Openings shall be provided in the bottom closure channel at top and bottom edges. Openings shall be provided in the bottom closure of exterior doors to permit the escape of entrapped moisture.
      g. Continuous hinge reinforcement: Provide welded continuous 12-gage strap for continuous hinges specified in hardware sets in Division 08: Openings.
      h. Electrical raceways: Provide raceways for standardized plug connectors to accommodate up to 12 wires as required for electrified door hardware specified in hardware sets in Division 08: Openings. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Wire nut connections are not acceptable.
      i. Doors in wet or humid areas shall have a top cap and solid foam interior core to prevent internal moisture accumulation and galvannealed.
      j. Edge profile shall be provided on both vertical edges of door as follows:
         1) Single-acting swing doors: Beveled 1/8 inch in two inches (2”).
      k. Hardware reinforcements:
         1) Doors shall be mortised, reinforced, drilled, and tapped at factory for fully template hardware, in accordance with the approved hardware schedule

and templates provided by Section 08 71 00: Door Hardware. Where surface-mounted hardware is to be applied, doors shall have reinforcing plates only.

2) Minimum gauges for hardware reinforcing plates shall be as follows:
   a) Hinge and pivot reinforcements: Seven (7) gauge.
   b) Reinforcements for lock face, flush bolts, concealed holders, concealed or surface-mounted closers: 12 gauge.

4. Glass moldings and stops: Loose stops shall be not less than 20-gauge steel, with butt corner joints, secured to frame opening by countersunk screws. Snap-on attachments will not be acceptable.
5. Louvers: Shall be inverted "V" blade, sight-proof type, unless noted otherwise.
6. Edge clearances:
   a. Between door and frame at head and jambs: 1/8 inch.
   b. At doorsills with no threshold: 5/8-inch to 3/4-inch above finished floor.
   c. At doorsills with threshold: As required to suit threshold.
   d. Between meeting edges of double doors: 1/8 inch.

B. Finish:
1. Shop paint steel (whether galvanized or ungalvanized) stops and accessories as follows:
   a. Clean surfaces free of mill scale, rust, oil, grease, dirt, and other foreign matter.
   b. Chemically treat surfaces and apply one (1) coat of an approved baked-on rust-inhibitive primer paint to provide a minimum 0.5 mil dry film thickness.

2. Field painted under Section 09 90 00: Painting and Coating.

C. Sound Rated Door: STC of 32, measured in accordance with ASTM E413.

D. Thermal Insulated Door: Total insulation R-Value of 44 measured in accordance with ASTM C1363, unless otherwise noted on Drawings.

2.5 LABELED DOORS AND FRAMES

A. Labeled doors and frames shall be provided for openings requiring fire protection ratings as scheduled and to comply with NFPA 80. Such doors and frames shall be constructed as tested and approved by UL, WHI, or other nationally recognized testing agency having a factory inspection service and approved by code authorities having jurisdiction and shall bear the appropriate permanent label.

B. If any door or frame scheduled to be fire-rated cannot qualify for appropriate labeling because of its size, design, hardware, or other reason, the Architect shall be so advised before fabrication work on that item is started. Indicate and highlight on shop drawing.

PART 3 EXECUTION

3.1 COORDINATION

A. Coordinate the work of this Section.

B. Coordinate hardware installation with opening construction. Finish hardware is specified in Section 08 71 00: Door Hardware.

C. Coordinate doors, frames, and windows with glazing specified in Section 08 80 00: Glazing.

D. Coordinate doors and frames with painting specified in Section 09 90 00: Painting and

Coating.

3.2 INSTALLATION

A. Separate dissimilar metals. Protect against galvanic action.

B. Frames:
1. Anchorage and connections: Secure to adjacent construction. Where practical, interior door frames shall be flush with the pull side wall to minimize or eliminate the reveal and allow full 180-degree door swing.
2. Install frames in accordance with manufacturer’s instructions and install labeled frames in accordance with NFPA 80.
3. Frame spreader bars: Leave intact until frames are set perfectly square and plumb and anchors are securely attached.
4. Remove hardware, with the exception of prime-coated items, tag box, and reinstall after finish paint work is completed. Do not remove or paint over labels on labeled frames.

C. Doors:
1. Install hardware in accordance with hardware manufacturer's templates and instructions.
2. Install doors in accordance with manufacturer’s instructions and install labeled doors in accordance with NFPA 80.
3. Adjust operable parts for correct function.
4. Remove hardware, with the exception of prime-coated items, tag, box, and reinstall after finish paint Work is completed. Do not remove or paint over labels on labeled doors.

3.3 ADJUST AND CLEAN

A. Adjust doors for proper operation, free from binding or other defects.

B. Clean and restore soiled surfaces.

C. Remove scraps and debris, and leave site in clean condition.

END OF SECTION 08 11 13

SECTION 08 31 13 ACCESS DOORS AND FRAMES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes access doors in gypsum board, masonry partitions, and plaster/stucco soffits, where shown or required.

B. Related Sections:
1. Section 06 10 00: Rough Carpentry.
2. Section 08 11 13: Hollow Metal Doors and Frames.
3. Section 09 21 16: Gypsum Board Assemblies.
4. Section 09 51 00: Acoustical Ceiling Panels.

1.3 SUBMITTALS

A. Product Data:
1. Manufacturer's literature, including schedules, charts, installation instructions, and illustrations to indicate the performance, fabrication, procedures, product variations, and accessories.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers listed whose products meet or exceed the specifications are approved for use on the Project. Other manufacturers must have a minimum of five (5) years' experience manufacturing access doors meeting or exceeding the specifications and comply with Division 01 requirements regarding substitutions in order to be considered:
1. Acudor Products, Inc., Las Vegas, NV (basis of design for rated floors).
2. Acudor Products, Inc., Las Vegas, NV (basis of design).
3. J. L. Industries, Commerce, CA
4. Karp Associates, Inc., Melville, NY.
5. The Bilco Company, New Haven, CT.
6. Babcock-Davis, San Lorenzo, CA.
7. Larsen's Manufacturing Co., Minneapolis, MN.
8. Milcor, Grand Rapids, MI.
9. Approved equal.

2.2 PRODUCTS

A. Standard type flush steel access door for plaster/stucco soffit construction:
1. Size: As shown on the Drawings.
2. Hinges: Concealed continuous piano type hinges.
3. Finish: Phosphate dipped and prime coated for field painting per Section 09 90 00: Painting and Coating.
4. Frames: 16-gauge galvanized steel with 22-gauge galvanized plaster casing bead.
5. Doors: 14-gauge galvanized steel.

6. Lock: Flush screwdriver operated cam.

B. Fire Rated, Two-Hour, Floor Access Door - Flush steel door for wallboard construction:
1. Listing: UL listed, compliant to NFPA 288.
2. Size: As shown on the Drawings.
3. Hinges: Heavy-duty Type 316 stainless steel butt hinge.
4. Finish: 20-gauge galvanized metal with gray primer on exterior frame; field painting per Section 09 90 00: Painting and Coating.
5. Frames: Extruded aluminum.
6. Doors: Single leaf.
7. Lock: Knurled knob/key operated latch bolt.
8. Insulation: Two-inch (2”) thick fire rated mineral fiber

C. Non-Rated Floor Access Door:
1. Listing: Not required.
2. Size: As shown on the Drawings.
3. Hinges: Heavy-duty Type 316 stainless steel butt hinge.
4. Finish: 20-Gauge galvanized finish with gray primer on exterior frame; field painting per Section 09 90 00: Painting and Coating.
5. Frames: 20-Gauge galvanized steel. Anchor to wood floor.
6. Doors: Single leaf.
7. Lock: Knurled knob/key operated latch bolt.
8. Hold open door.

D. Ceiling Access Door:
1. Listing: Not required.
2. Size: As shown on the Drawings.
3. Hinges: Heavy-duty Type 316 stainless steel butt hinge.
4. Finish: 20-gauge galvanized finish with gray primer on exterior frame; field painting per Section 09 90 00: Painting and Coating.
5. Frames: Extruded aluminum. Anchor to wood floor.
6. Doors: Single leaf.
7. Lock: Knurled knob/key operated latch bolt.
8. Hold open door.

PART 3 EXECUTION

3.1 INSTALLATION

A. Locate and provide access doors in walls (and floors) to construct the wall as indicated on Drawings and provide access doors and panels to fit the wall condition. Maintain designated wall types as indicated on Drawings.

3.2 LOCATIONS

A. Provide where required by code and where needed to service and maintain equipment.

B. If not shown on the Drawings, consult the Architect before locating in finished spaces.

END OF SECTION 08 31 13

SECTION 08 41 13 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Exterior and interior storefront framing.
   2. Exterior and interior manual swing entrance doors.
   3. Accessories necessary for a complete installation.

B. Related Sections:
   1. Division 07: Thermal and Moisture Protection.

1.3 SUBMITTALS

A. Product Data: Technical data for each type of product indicated including construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum framed systems.

B. Shop Drawings:
   1. Submit aluminum storefront framing and entrances shop drawings including plans, elevations, sections, full size details, and attachments to other work:
      a. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.
      b. For entrance doors, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.

C. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

D. Engineer’s calculations of performance requirements.

E. Maintenance Data: For aluminum framed systems to include in maintenance manuals.

1.4 PERFORMANCE REQUIREMENTS

A. Aluminum framed systems shall withstand the effects of specified performance requirements without exceeding performance criteria or fail due to defective manufacture, fabrication, installation, or other defects in construction:
   1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
   2. Dimensional tolerances of building frame and other adjacent construction.
   3. Failure includes the following:
      a. Deflection exceeding specified limits.
      b. Thermal stresses transferring to building structure.

c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
d. Noise or vibration created by wind and by thermal and structural movements.
e. Loosening or weakening of fasteners, attachments, and other components.
f. Sealant failure.
g. Failure of operating units.

B. Structural Loads:
1. Wind loads: Ultimate wind speed gust 115 mph; exposure D. These criteria are conservative, could be reduced to 100 mph with exposure C to match the site-specific requirements.

C. Deflection of Framing Members:
1. Deflection normal to wall plane: Limited to edge of glass in a direction perpendicular to glass plane shall not exceed L/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
2. Deflection parallel to glazing plane: Limited to L/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.

D. Structural Test Performance - Provide aluminum framed systems tested according to ASTM E330 as follows:
1. When tested at positive and negative wind load design pressures, systems do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test durations: As required by design wind velocity, but not fewer than ten (10) seconds.

E. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft.0.03 L/s per sq. m of fixed wall area when tested according to ASTM E283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa.)

F. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa.

G. Windborne Debris Impact Resistance:
1. Pass missile impact and cyclic pressure tests when tested according to ASTM E1886 and testing information in ASTM E1996 for Wind Zone 4:
a. Large missile test: For glazed openings located within 30 feet (9.1 m) of grade.

H. Thermal Movements:
1. Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss:
a. Temperature change (range): 120 degrees F (67 degrees C, ambient; 180 degrees F, 100 degrees C, material surfaces.
b. Interior ambient-air temperature: 75 degrees F (24 degrees C).

I. Condensation Resistance: Provide aluminum framed systems with fixed glazing and framing

areas having condensation-resistance factor (CRF) of not less than 45 when tested according to AAMA 1503.

J. Thermal Conductance: Provide aluminum framed systems with fixed glazing and framing areas having an average U-factor of not more than 0.57 Btu/sq. ft. x h x degrees F3.23 W/sq. m x K when tested according to AAMA 1503.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Accessibility requirements:
      a. 2022 California Building Code: Section 11B-404.3 accessible route.
      b. 2022 California Building Code: Section 11B-309.4 operable parts interior usage.
      c. U.S. Architectural and Transportation Barriers Compliance Board Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).
      d. ICC/ANSI A117.1 Accessible and Useable Building and Facilities.

B. Installer Qualifications: Installer having minimum ten (10) years' documented experience who is an authorized representative of the manufacturer and is trained and approved for installation of units required.

C. Engineering Responsibility: Prepare data for aluminum framed systems, including shop drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated.

D. Product Options:
   1. Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in service performance:
      a. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.

E. Source Limitations: Obtain aluminum framed entrances from single source from single manufacturer.

F. Pre-Installation Conference: Conduct conference at site.

1.6 WARRANTY

A. Written warranty signed by manufacturer, Contractor, and installer in which manufacturer agrees to repair or replace components of aluminum framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including, but not limited to, excessive deflection.
      b. Noise or vibration caused by thermal movements.
      c. Water leakage through fixed glazing and framing areas.
      d. Failure of operating components.
   2. Warranty period: Two (2) years from date of Substantial Completion.

B. Written warranty signed by manufacturer in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or

workmanship within specified warranty period. Warranty does not include normal weathering:

1. Warranty period: Ten (10) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

A. Basis of Design:
   1. **Kawneer Trifab 451/451T** (Product Evaluation CWSF-34), And/or the **Trifab 601/601T**, impact resistant system, maximum design pressure +/- 45 psf. Refer to Drawings for frame size and locations. Subject to compliance with requirements, provide comparable storefront system by one of the following:
      a. Tubelite, Inc.
      b. US Aluminum Corporation.
      c. Vistawall.
      d. YKK America AP, Inc.

B. Aluminum:
   1. Alloy and temper recommended by manufacturer for type of use and finish indicated:
      a. Sheet and plate: ASTM B209ASTM B209M.
      b. Extruded bars, rods, profiles, and tubes: ASTM B221ASTM B221M.
      c. Extruded structural pipe and tubes: ASTM B429.

C. Framing Members:
   1. Extruded aluminum framing members of thickness required and reinforced necessary to support imposed loads:
      a. Construction: Thermal.
      b. Glazing system: Retained mechanically with gaskets on four sides.
      c. Glazing plane: Center.

D. Accessories:
   1. Brackets and reinforcements: High strength aluminum with nonstaining, nonferrous shims for aligning system components.
   2. Fasteners and accessories:
      a. Corrosion resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials:
         1) Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
         2) Reinforce members as required to receive fastener threads.
   3. Concrete and masonry inserts: Hot dip galvanized cast iron, malleable iron, or steel inserts, complying with ASTM A123/A123M or ASTM A153/A153M.
   4. Concealed flashing: Corrosion resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
   5. Framing system gaskets and sealants: Recommended by manufacturer for joint type.

E. Glazing:
   1. Refer to Section 08 80 00: Glazing for impact resistant laminated insulating glass with low-e coating on Number 2 surface:
      a. Glazing gaskets: Compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.
      b. Spacers and setting blocks: Elastomeric type.

F. Accessories:
   1. Joint sealants: For installation at perimeter of aluminum framed systems, refer to

Division 07, Thermal and Moisture Protection.

2. Bituminous paint: Cold applied, asphalt mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil 0.762 mm thickness per coat.

2.2 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Framing Members:
   1. Fabricate components that, when assembled, have specified characteristics:
      a. Profiles that are sharp, straight, and free of defects or deformations.
      b. Accurately fitted joints with ends coped or mitered.
      c. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
      d. Physical and thermal isolation of glazing from framing members.
      e. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
      f. Provisions for field replacement of glazing from interior for vision glass and exterior for spandrel glazing or metal panels.
      g. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
      h. Provide sill receptors with end dams at all sill conditions.

C. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

D. Storefront Framing: Fabricate components for assembly using screw spline system.

E. Entrance Door Frames:
   1. Reinforce as required to support loads imposed by door operation and for installing entrance door hardware:
      a. At exterior doors, provide weather stripping at fixed stops.
      b. At interior doors, provide weather stripping at stops to prevent metal to metal contact.

F. Entrance Doors:
   1. Reinforce doors as required for installing entrance door hardware:
      a. At pairs of exterior doors, provide compression type weather stripping retained in adjustable strip and mortised into door edge.
      b. At exterior doors, provide weather sweeps applied to door bottoms.

G. After fabrication, clearly mark components to identify their locations in Project according to shop drawings.

2.3 ALUMINUM FINISHES

A. Class I, Clear Anodic Finish (#14): AA-M10C21A41 / AA-M45C22A41, 0.018 mm or thicker.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for aluminum framed systems by field measurements before fabrication and indicate measurements on shop drawings.

3.2 EXAMINATION

A. Examine areas and conditions for compliance with requirements for installation tolerances and conditions affecting performance of the work. Proceed with installation after correcting unsatisfactory conditions.

3.3 INSTALLATION

A. Comply with aluminum framed storefront manufacturer recommended installation instructions. Coordinate installation with curtain wall work:
   1. Do not install damaged components.
   2. Fit joints to produce hairline joints free of burrs and distortion.
   3. Rigidly secure nonmovement joints.
   4. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
   5. Seal joints watertight unless otherwise indicated.
   6. Min anchorage #8 with two-inch (2”) minimum embedment; minimum two inches (2”) from edges. Refer to shop drawings.

B. Metal Protection:
   1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
   2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Set continuous sill members and flashing in full sealant bed as specified in Division 07, Thermal and Moisture Protection to produce weathertight installation.

E. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

F. Install glazing specified in Section 08 80 00: Glazing.

G. Entrance Doors and Hardware:
   1. Install doors to produce smooth operation and tight fit at contact points:
      a. Exterior doors: Install to produce weathertight enclosure and tight fit at weather stripping.
      b. Field installed entrance door hardware: Install surface mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

H. Install perimeter joint sealants as specified in Division 07, Thermal and Moisture Protection to produce weathertight installation.

3.4 ERECTION TOLERANCES

A. Install aluminum framed systems to comply with the following maximum erection tolerances:
   1. Location and plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
   2. Alignment:
      a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm).

b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).

B. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

3.5 ADJUSTING

A. Adjust operating entrance door hardware to function smoothly as recommended by manufacturer:
   1. For entrance doors accessible to people with disabilities, adjust closers to provide a three (3) second closer sweep period for doors to move from a 70-degree open position to three inches (75 mm) from the latch, measured to the leading door edge.

3.6 MAINTENANCE SERVICE

A. Entrance Door Hardware:
   1. Maintenance tools and instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.
   2. Initial maintenance service: Beginning at Substantial Completion, provide six (6) months full maintenance by skilled employees of entrance door hardware installer. Include quarterly preventive maintenance, repair, or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper entrance door hardware operation at rated speed and capacity. Provide parts and supplies the same as those used in the manufacture and installation of original equipment.

END OF SECTION 08 41 13

SECTION 08 51 13 ALUMINUM WINDOWS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies architectural aluminum type windows as indicated on Drawings with integral glazing units and accessories.

B. Related Sections:
1. Section 01 33 00: Submittal Procedures.
2. Section 01 60 00: Product Requirements.

C. Reference Standards:
1. American Architectural Manufacturer's Association (AAMA):
   a. AAMA/WDMA/CSA101/I.S.2/A440 North American Fenestration Standard/Specification for Windows, Doors, and Skylights, Includes Update No. 1.
   b. AAMA 502 Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
   c. AAMA 609 Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
   d. AAMA 611 Voluntary Standards for Anodized Architectural Aluminum.
   e. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).
2. Glass Association of North America (GANA):
   a. GANA 01-0300 Proper Procedures for Cleaning Architectural Glass Products.
3. ASTM International (ASTM):
   a. ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
   b. ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
   c. ASTM E547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
   d. ASTM F588 Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
4. National Fenestration Rating Council (NFRC):
   a. NFRC 100A Procedure for Determining Fenestration Attachment Product U-Factors.
   b. NFRC 200A Procedure for Determining Attachment Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
   c. NFRC 500 Procedure for Determining Fenestration Product Condensation Resistance Values.
5. US Green Building Council (USGBC):
   a. LEED NC Version 2.2, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package for New Construction and Major Renovations.

1.3 SUBMITTALS

A. Product Data - Manufacturer's standard specifications and descriptive literature, including:
   1. Certified test laboratory reports to show compliance with requirements:
      a. Windows with sizes exceeding the gateway sizes do not qualify under these tests.
      b. Windows manufactured with configurations different than the tested configurations do not qualify under these tests; windows can be tested for performance outside the already tested gateway sizes.
      c. Windows with hardware different from what is referenced on the test reports do not qualify under these tests.
   2. Manufacturer's standard head, jamb, and sill details.

B. Manufacturer's Certificates: Submit certified independent testing agency reports indicating window unit meets or exceeds specified performance requirements.

C. Shop Drawings - For each installation and for special components not dimensioned or detailed in manufacturer's product data:
   1. Provide shop drawings indicating details of construction and installation including, but not limited to, window location chart, window schedule, size, muntin type and design, sections and details of multiple window assemblies, hardware, glazing details, frame type, STC, glass types, screens, and handing operation.

D. Samples:
   1. Window section:
      a. Submit eight-inch by eight-inch (8" × 8") minimum corner section sample of frame for each glazing type specified.
      b. Sample will be used to verify construction, corner joint, frame finish and color.
      c. Quantity [5].
   2. Glazing:
      a. Insulated glazing [12 × 12 inch].
   3. Finish - AAMA 611 Anodized Architectural Coatings; AAMA 2605 for Organic Coatings on Aluminum Extrusions:
      a. [Class 1 Anodized].

E. Manufacturer's written instructions, including:
   1. Delivery, storage, and handling recommendations.
   2. Preparation and installation recommendations.

F. Installer's Experience: Submit verification of evidence of work similar to work of this Section.

G. Warranty:
   1. Fully executed, issued in [Owner's] name and registered with manufacturer, including:
      a. Manufacturer's [1 year] warranty, from date of accepted delivery, covering defects in materials.

H. Sustainable Design (LEED) Submittals:
   1. LEED Submittals.
   2. Submit verification for items when appropriate as follows:
      a. MR 5 - Regional Materials.

1.4 PERFORMANCE REQUIREMENTS

A. Design pressure, air infiltration, and water penetration:
   1. Comply with AAMA /WDMA/CSA 101/I.S.2/A440 CW-PG35.

B. Uniform Load Deflection and Uniform Load Structural to ASTM E330.

C. ASTM E283, Air Leakage: 1.57 psf: 0.3 cfm/ft2 maximum.

D. ASTM E547, Water Penetration: at 4.59 psf: no leakage.

E. ASTM F588, Forced Entry Resistance: Type B Grade 10: Pass for no entry.

F. U-Value.

G. Solar Heat Gain Coefficient (SHGC).

H. Acoustical Performance: STC.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Minimum ten (10) years' experience in producing aluminum windows of the type specified:
      a. Manufacturer must be certified through the PPG Certified Window Fabricator Program.

B. Installer Qualifications: Licensed contractor with a minimum three (3) years' experience installing similar windows.

C. Mockups:
   1. Provide and install at jobsite a mockup using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's acceptance of finish color and workmanship standard:
      a. Maintenance: Maintain mockup during construction for workmanship comparison; remove and legally dispose of mockup when no longer required.
      b. Incorporation:
         1) Mockup may be incorporated into final construction upon Owner's and Architect's approval.
      c. Modify mockup as required to produce acceptable work.

D. Source Quality Control:
   1. Use only fabricators who have training and experience with similar work of this Section.
   2. Ensure all window framing materials come from single manufacturer.

E. Field Quality Control:
   1. Comply with AAMA 502.
   2. Field testing performance: To AAMA 502.
   3. Proper execution of the field test:
      a. Ensure window is plumb, level, and square:
         1) If conditions fall outside the +/-1/8-inch tolerance, do not test product.
         2) Test at a pressure greater than 2/3 the fenestration product laboratory test pressure.
   4. Qualification of the agency performing the test: Ensure agency is an AAMA accredited independent testing agency.
   5. Site visits:
      a. Schedule site visits to review work at stages listed:
         1) After delivery and storage of aluminum windows and when preparatory work on which work of this Section depends is complete, but before application begins.

2) Twice during progress of work at 25 percent and 60 percent complete.
3) Upon completion of work, after cleaning is carried out.
4) Obtain reports within three (3) days of review and submit immediately to Architect.

1.6 WARRANTY

A. Manufacturer's Warranty:
   1. Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official.
   2. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery:
   1. Deliver materials in accordance with manufacturer's written instructions and labeling.
   2. Deliver materials in manufacturer's original, unopened, undamaged containers or packaged with identification labels intact, and product name and manufacturer clearly visible and in sizes to suit Project.

B. Storage: Store materials upright and protected from exposure to harmful environmental conditions, clean, dry, frost-free, and at manufacturer's recommended temperature and humidity levels.

C. Handling:
   1. Exercise care during off-loading and installation to avoid damage and marring of finishes.
   2. Handle in a manner to evenly distribute material load and prevent twisting, ending, and cracking of windows, doors, and associated parts.
   3. Replace materials damaged during handling.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturer: All Weather Architectural Aluminum, 777 Aldridge Road, Vacaville, California 95688; Phone: (707) 452-1600; Fax: (707) 452-1616; Email: randy.agno@allweatheraa.com; Website: www.allweatheraa.com.

B. Basis for Design: Series 5000 Windows by All Weather Architectural Aluminum.

C. Information, including sample (size and configuration per Architect's requirements) must be submitted for consideration a minimum of ten (10) days before Project bid date.

2.2 DESCRIPTION

A. Acceptable Material - Series 5000 Outside Glazed Windows by All Weather Architectural Aluminum:
   1. Aluminum framed [fixed,] [casement,] [awning,] [hopper], [and] [combination] windows [as indicated] [single glazing] [insulating glazing units (IGU)] and accessories.
      a. Window dimensions: See Drawings for window types and configurations.

2.3 MATERIALS

A. Frames – 2-1/4 inches Pour and Debridge, thermally broken extruded aluminum Type 6063 age hardened to T-6 rating for strength and durability:
   1. Integral extrusion wall thickness: 0.094 inches.
   2. Nominal web thickness: 1/8 inch.
   3. Include full perimeter exterior snap in glazing stops.
   4. Corners of frame and ventilators: Mitered and welded; muntin and intermediate bars attached to cross joints and abutting sash sections.
   5. Operating sash: Mitered, corner keyed and crimped frames.
   6. Finish types:
      a. Aluminum to AA DAF-45, [Class 1, clear anodized] [Class 1, bronze anodized] Custom anodized color [__].
      b. 70% Kynar paint color [___] [custom] [selected by Architect from manufacturer's standard range].
      c. Dual finish: Inner frame color [____]; Outer frame color [___].

B. Glazing:
   1. [Single glazed] [1/2 inch].
   2. [Insulated glass] [1 inch].

2.4 FABRICATION

A. Miter and weld corner joints of frames.

B. Vents: Mitered, corner keyed, and crimped.

C. Attach muntin and intermediate bars to cross joints and abutting sections.

D. Ensure sill, vents, and intermediate bars have weep holes and are sloped for positive drainage to exterior.

E. Pre-drill and tap frames to receive screen attachment hardware as required.

F. Ensure surfaces to be glazed include bead retaining notch.

G. Ensure operable windows include two rows of weather-stripping in extruded slot at perimeter of vent or opening.

H. Install hardware specified.

2.5 ACCESSORIES

A. Hardware:
   1. For casement windows: [4 bar heavy duty stainless steel concealed hinges], [die cast zinc cam handles with pole ring] [worm gear rotary control operator with butt hinges and side mounted multi-locking handle].
   2. For hopper windows: 4 bar heavy duty stainless steel hinges, [cam handle with pawl] [snaplock].
   3. For awning windows: [4 bar heavy duty stainless steel concealed hinges, die cast zinc cam handles with pole ring] [worm gear rotary hardware with loose pin concealed hinges and side mounted locking handles].

B. Screens - Painted roll formed aluminum frames finished to match window frames, factory-drilled/tapped to receive screen attachment hardware:
   1. Screen hardware:
      a. Charcoal fiberglass.
      b. Wire.

c. Ultraview™.
d. Plastic wicket doors.

C. Weatherstripping: 64A durometer black santoprene bulb insert.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
1. Verify that conditions of substrate previously installed under other Sections or contracts are acceptable for aluminum window installation in accordance with manufacturer's written recommendations:
a. Visually inspect substrate.
b. Verify openings are dimensionally correct and within allowable tolerances, and substrates are plumb, level, and clean.
c. Verify in the presence of the Architect that anchoring surface is in accordance with approved shop drawings.
d. Inform Architect of unacceptable conditions immediately upon discovery.
e. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Architect.
f. Starting window installation implies substrate conditions are acceptable for work of this Section.

3.2 INSTALLATION

A. Install aluminum windows in accordance with manufacturer's written recommendations:
1. Ensure operable windows are closed and locked during installation.

3.3 SEALANTS

A. Apply sealant in accordance with manufacturer's written installation guidelines.

3.4 CLEANING

A. Clean sealants, caulking, and other materials from surfaces, including adjacent work.

B. Clean window frames, casings, and glass using materials and methods recommended by the window and glass manufacturer that do not cause defacement of work:
1. Clean using methods that comply with AAMA 609.
2. Clean glass using methods that comply with GANA 01-0300.

C. Protect installed products until completion of Project.

D. Touch-up, repair, or replace damaged products before Substantial Completion.

3.5 PROTECTION

A. Protect installed aluminum windows from damage during construction.

B. Repair or replace adjacent materials damaged by installation of aluminum windows.

END OF SECTION 08 51 13

SECTION 08 71 00 DOOR HARDWARE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.

B. Related Sections:
   1. Section 08 11 13: Hollow Metal Doors and Frames.
   2. Section 08 14 16: Flush Wood Doors.

C. Reference Standards:
   1. Comply with the current version if not otherwise specified:
      a. California Building Code (CBC): Section 11B-404.
      b. ANSI A117.1 Accessible and Usable Buildings and Facilities.
      c. NFPA 70 National Electrical Code.
      d. NFPA 80 Fire Doors and Windows.
      e. NFPA 101 Life Safety Code.
      f. NFPA 105 Installation of Smoke Door Assemblies.
      g. State Building Codes, Local Amendments, if applicable.
   2. All hardware specified herein shall comply with the following industry standards:
      a. ANSI/BHMA Certified Product Standards A156 Series
      b. UL10C Positive Pressure Fire Tests of Door Assemblies

1.3 DEFINITIONS

A. Door hardware includes, but is not necessarily limited to, mechanical door hardware.

1.4 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions, and finishes.

B. Door Hardware Schedule:
   1. Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware:
      a. Format: Comply with scheduling sequence and vertical format in DHI's Sequence and Format for the Hardware Schedule.
      b. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets in Part 4. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
      c. Content - include the following information:

1) Type, style, function, size, label, hand, and finish of each door hardware item.
2) Manufacturer of each item.
3) Fastenings and other pertinent information.
4) Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
5) Explanation of abbreviations, symbols, and codes contained in schedule.
6) Mounting locations for door hardware.
7) Door and frame sizes and materials.
8) Warranty information for each product.

d. Submittal sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the Owner has taken place, prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers, and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Section 01 77 00: Closeout Procedures.

1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum five (5) years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum three (3) years' documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum five (5) years' documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations:
1. Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated:
   a. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference:
1. Conduct conference to comply with requirements in Division 01. Keying conference to incorporate the following criteria into the final keying schedule document:
   a. Function of building, purpose of each area, and degree of security required.
   b. Plans for existing and future key system expansion.
   c. Requirements for key control storage and software.
   d. Installation of permanent keys, cylinder cores, and software.
   e. Address and requirements for delivery of keys.

G. Pre-Submittal Conference:
1. Conduct coordination conference in compliance with requirements in Division 01 with attendance by representatives of supplier(s), installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware:
   a. Prior to installation of door hardware, conduct a Project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal, and wood doors. Training will include the use of installation manuals, hardware schedules, templates, and physical product samples as required.
   b. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
   c. Review sequence of operation narratives for each unique access controlled opening.
   d. Review and finalize construction schedule and verify availability of materials.
   e. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

I. Regulatory Requirements:
1. Doors and doorways as part of an accessible route shall comply with CBC Sections 11B-404.
2. Locate latching hardware between 34 inches to 44 inches above the finished floor, per-California Building Code, Section 11B-404.2.7:
   a. Panic hardware: Locate between 36 inches to 44 inches above the finished floor.
3. Handles, pull, latches, locks, other operable parts**:**
   a. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate. California Building Code Section 11B-309.4.
   b. Force required to activate the operable parts: Five (5.0) pounds maximum, per California Building Code Section 11B-309.4.
4. Adjust doors to open with not more than five (5.0) pounds pressure to open at exterior doors and five (5.0) pounds at interior doors. As allowed per California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15 pounds:
   a. Exception: Exterior doors’ pressure-to-open may be increased to 8.5 pounds if at a single location, and one (1) of a bank of eight (8) leafs or fraction of eight, and one (1) leaf of this bank is fitted with a low or high energy operator.
5. Low energy powered doors - comply with ANSI/BHMA A156.19; California Building Code Section 11B-404.2.9, Exception 2:
   a. Where powered door serves an occupancy of 150 or more, provide back-up battery

power or stand-by generator power, capable of supporting a minimum of 100 cycles.
   b. Actuators, vertical bar type: Minimum two inches (2") wide, 30 inches high, bottom located minimum five inches (5") above floor or ground, top located minimum 35 inches above floor or ground. Displays International Symbol of Accessibility, per California Building Code Section 11B-703.7.
   c. Actuators, plate type: Use two (2) at each side of the opening. Minimum four inches (4") diameter or four inches (4") square. Displays International Symbol of Accessibility, per California Building Code Section 11B-703.7. Locate centerline of lower plate between seven and eight inches (7" - 8") above floor or ground, and upper plate between 30 inches and 44 inches above floor or ground.
   d. Actuator location: Conspicuously located, clear, and level floor/ground space for forward or parallel approach.
6. Adjust door closer sweep periods so that from an open position of 90 degrees, the door will take at least five (5) seconds to move to a point 12 degrees from the latch, measured to the landing side of the door, per California Building Code Section 11B-404.2.8:
   a. Spring hinges: Adjust for 1.5 seconds minimum for 70 degrees to fully closed.
7. Smooth surfaces at bottom ten inches (10") of push sides of doors, facilitating push-open with wheelchair footrests, per California Building Code Section 11B-404.2.10:
   a. Applied kickplates and armor plates: Bevel the left and right edges; free of sharp or abrasive edges.
   b. Tempered glass doors without stiles: Bottom rail may be less than ten inches (10") if top leading edge is tapered 60 degrees minimum.
8. Door opening clear width no less than 32 inches, measured from face of frame stop, or edge of inactive leaf of pair of doors, to door face with door opened to 90 degrees. Hardware projection not a factor in clear width if located above 30 inches and below 80 inches, and the hardware projects no more than four inches (4"); California Building Code Section 11B-404.2.3:
   a. Exception: In alterations, a projection of 5/8-inch (15.9 mm) maximum into the required clear width shall be permitted for the latch side stop.
   b. Door closers and overhead stops: Not less than 78 inches above the finished floor or ground, per California Building Code 11B-307.4.
9. Thresholds**:**
   a. Floor or landing no more than 0.50 inch below the top of the threshold of the doorway, per California Building Code Section 11B-404.2.5.
   b. Vertical rise no more than 0.25 inch, change in level between 0.25 inch and 0.50 inch**:** Beveled to slope no greater than 1**:**2 (50 percent slope); California Building Code Section 11B-303.2 & ~.3.
10. Floor stops**:** Do not locate in path of travel. Locate no more than four inches (4") from walls, per DSA Policy #99-08 (Access).
11. Pairs of doors with independently activated hardware both leafs**:** Limit swing of right-hand or right-hand-reverse leaf to 90 degrees to protect persons reading wall-mounted tactile signage, per California Building Code Section 11B-703.4.2.
12. Door and door hardware encroachment**:**
   a. When door is swung fully open into means-of-egress path, the door may not encroach/project more than seven inches (7") into the required exit width, with the exception of door release hardware such as lockset levers or panic hardware. These hardware items must be located no less than 34 inches and no more than 48 inches above the floor/ground; California Building Code, Section 1005.7.1:
      1) In I-2 occupancies, latch release hardware is not permitted to project in the required exit width, regardless of its mounting height, per California Building Code, Section 1005.7.1 at Exception 1.

1.6 WARRANTY

A. General Warranty: Reference Division 01. 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. Warranty Period:
   1. Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
      a. Structural failures including excessive deflection, cracking, or breakage.
      b. Faulty operation of the hardware.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      d. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: Two (2) years from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:
   1. Locksets; Three (3) years.
   2. Extra heavy duty cylinder locks: Seven (7) years.
   3. Exit devices: Three (3) years mechanical, one (1) year electrical.
   4. Closures: Ten (10) years mechanical, One (1) year electrical.
   5. Hinges: One (1) year.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software, or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software, and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the Keying Conference.

PART 2 PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets of Part 4. Products are identified by using door hardware designations, as follows.

C. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the Architect, Owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges - ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets:
   1. Quantity - provide the following hinge quantity, unless otherwise indicated:
      a. Two (2) hinges: For doors with heights up to 60 inches.
      b. Three (3) hinges: For doors with heights 61 to 90 inches.
      c. Four (4) hinges: For doors with heights 91 to 120 inches.
      d. For doors with heights more than 120 inches, provide four (4) hinges, plus one (1) hinge for every 30 inches of door height greater than 120 inches.
   2. Hinge size - provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
      a. Widths up to three feet (3’0”): 4-1/2-inch standard or heavy weight as specified.
      b. Sizes from three-feet-one-inch (3’1”) to four feet (4’0”): Five-inch (5”) standard or heavy weight as specified.
   3. Hinge weight and base material - unless otherwise indicated, provide the following:
      a. Exterior doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
      b. Interior doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
   4. Hinge options - comply with the following where indicated in the Hardware Sets or on Drawings:
      a. Non-removable pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
      b. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable. Use wide-throw conventional or continuous hinges as needed up to eight inches (8”) in width to allow door to stand parallel to wall for true 180-degree opening. Advise architect if eight-inch (8”) width is insufficient.
   5. Acceptable Manufacturer:
      a. Schlage (basis of design).
      b. Manufacturer representative: Chris Clark Chris.clark@allegion.com (626) 390-0599.

2.3 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum ten (10) years’ experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices - Schlage, unless otherwise indicated.

C. Cylinders:
   1. Original manufacturer cylinders complying with the following:
      a. Mortise type: Threaded cylinders with rings and cams to suit hardware application.
      b. Rim type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
      c. Bored-lock type: Cylinders with tailpieces to suit locks.
      d. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

e. Keyway: Match facility standard.

D. Keying System:
1. Schlage Everest 29 Primus IC Core (keying by District):
a. Conduct specified Keying Conference to define and document keying system instructions and requirements.
b. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by District.
c. Existing system: Key locks to Owner's existing system.

E. Key Quantity:
1. Provide the following minimum number of keys:
a. Change keys per cylinder: Two (2).
b. Master keys (per master key level/group): Five (5).
c. Construction keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):
1. Provide keying transcript list to District representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the District.

2.4 MECHANICAL LOCKS AND LATCHING DEVICES

A. Locksets, Grade 1 (Heavy Duty):
1. ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body:
a. Acceptable manufacturers:
1) ND Series x Rhodes:
a) ND10S Passage Lock.
b) ND40S Privacy Lock.
c) L9485x06AxL283-722 Faculty Restroom Lock (Faculty – single compartment toilet) – Finish: 626.
d) ND91PD Office Lock.
e) ND96PD at IDF/Cust/Fire Riser/Elec. Rooms.
f) ND95PD Classroom Security Lock: At Middle and High Schools.
2) Schlage, mortise type.
3) Schlage L Series mortise indicators “N” escutcheons.
4) Outward opening doors will have Schlege LG13 Astragals.

2.5 PADLOCK

A. Schlage: KS43D2200 (Padlock) – Finish: Brass.

2.6 LOCK AND LATCH STRIKES

A. Strikes:
1. Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
a. Flat-lip strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
b. Extra-long-lip strikes: For locks used on frames with applied wood casing trim.

c. Aluminum-frame strike box: Provide manufacturer's special strike box fabricated for aluminum framing.
d. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards:
1. Comply with the following:
a. Strikes for mortise locks and latches: ANSI/BHMA A156.13.
b. Strikes for bored locks and latches: ANSI/BHMA A156.2.
c. Strikes for auxiliary deadlocks: ANSI/BHMA A156.36.
d. Dustproof strikes: ANSI/BHMA A156.16.

2.7 FLUSH BOLTS

A. Approved Manufacturer – Ives - Finish: US26D.
1. FB31P: Automatic, metal doors, storage and utility rooms.
2. FB51P: Manual, metal doors, storage and utility rooms.

2.8 CONVENTIONAL EXIT DEVICES

A. General Requirements:
1. All exit devices specified herein shall meet or exceed the following criteria:
a. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
b. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
c. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
d. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
e. Lever operating trim - Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts:
1) Lock trim design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
2) Where function of exit device requires a cylinder, provide a cylinder (rim or mortise) as specified in Hardware Sets.
f. Vertical rod exit devices: Where concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
g. Narrow stile applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum two-inch (2”) wide stiles.
h. Dummy push bar: Nonfunctioning push bar matching functional push bar.
i. Rail sizing: Provide exit device rails factory sized for proper door width application.
j. Through bolt installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty):
1. ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature:

a. Acceptable manufacturers:
1) Von Duprin 99 Series (basis of design).

2.9 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
2. Standards: Closers to comply with UL 10C for Positive Pressure Fire Test and be UL listed for use of fire rated doors.
3. Cycle testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
4. Size of units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
5. Closer arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
7. Closer accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers, and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Commercial Duty):
1. ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard:
a. Acceptable manufacturer (basis of design): L.C.N. (Grade 1 4040XP).

C. Coordinator Use coordinator only where required by fire code.
1. Ives – COR x FL x MB (Storage & Utility Rooms) – Finish: USP.

2.10 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Stop Holders – Ives:
1. FS43 (Automatic Door Stops and Holders) – Finish: US26D.
2. FS436/R435 (Interior Floor Stop) – Finish: US26D.

C. Door Stops and Bumpers:
1. ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders:
a. Acceptable manufacturer (basis of design): Trimco (TC).

2.11 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications, provide non-corrosive fasteners and elsewhere where indicated.

B. Acceptable Manufacturer: Pemko Manufacturing (PE).

C. Smoke Labeled Gasketing:
   1. Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784:
      a. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

D. Fire Labeled Gasketing:
   1. Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL 10C:
      a. Provide intumescent seals as indicated to meet UL 10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

E. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

F. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

G. Weatherstripping:
   1. Manufacturer: Pemco.
      b. Alternate: Zero.
   2. Model: 319N
   3. Finish: Clear Anodized w/ Black EPDM insert.

H. Thresholds - Must comply “Path of Travel” requirements and CBC Section 11B-404.2.5:
   1. Manufacturer: Pemko.
      c. Alternate: Zero.
   2. Model Series: 170
   3. Finish: Aluminum.

I. Thresholds: Must comply Path of Travel requirements and CBC Section 11B-404.2.5.

J. On all exterior doors exposed to weather (no cover) provide Rain Guard full width of door.

2.12 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 ACCESSORIES

A. Automatic Door Bottom – Pemko –. Finish: Clear.

B. Door Sweep – Pemko – Finish: Clear.

C. Meeting Stiles – Pemko 319N:
1. Finish: Clear.

D. Head and Jamb – Pemko 319N – Clear alum finish.

E. Rain Edge – Pemko 346 (Rain drip) Clear alum finish.

2.14 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 EXECUTION

3.1 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced, and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling, and access control system hardware without additional in-field modifications.

3.2 EXAMINATION

A. Examine scheduled openings, with installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify Architect of any discrepancies or conflicts between the door schedule, door types, Drawings, and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.3 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.4 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications:
   1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including hanging devices, locking devices, closing devices, and seals.

B. Mounting Heights:
   1. Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
      a. Standard steel doors and frames: DHI's Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.
      b. Where indicated to comply with accessibility requirements, CBC Section 11B-309.4 for mounting heights, and/or comply with ANSI A117.1 Accessibility Guidelines for Buildings and Facilities.
      c. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09: Finishes Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Section 07 92 00: Joint Sealants.

E. Storage: Provide a secure lock up for hardware delivered to the Project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.5 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating, and adjusted.

3.6 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.7 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Owner occupancy.

3.8 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.9 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 4 SCHEDULE

4.1 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the Owner and Architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware, and missing items should be brought to the attention of the Architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

SpeXtra: 413214 (ALLEGION SPEC LISTING)

HARDWARE GROUP NO. 01 (EXTERIOR SINGLE CLASSROOM DOOR)

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	CLASSROOM SECURITY	L9071T 06N L283-711	626	SCH
2	EA	PRIMUS CORE	20-740	626	SCH
1	EA	LOCK GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS18L/FS18S AS REQ'D	BLK	IVE
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	547A-223 OR AS DETAILED	A	ZER

HARDWARE GROUP NO. 02 (INTERIOR SINGLE CLASSROOM DOOR)

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	CLASSROOM SECURITY	L9071T 06N L283-711	626	SCH

2	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS436/FS438 AS REQ'D	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

HARDWARE GROUP NO. 3 (INTERIOR MECHANICAL ROOM DOOR)

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 06N	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS436/FS438 AS REQ'D	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

HARDWARE GROUP NO. 4 (EXTERIOR TOILET ROOM DOORS)

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 SH 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	L9080T 06N	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	LOCK GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS18L/FS18S AS REQ'D	BLK	IVE
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	547A-223 OR AS DETAILED	A	ZER

HARDWARE GROUP NO. 5 (EXTERIOR SINGLE ACCOMMODATION TOILET ROOMS)

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PRIVACY INDICATOR LOCK	L9456T 06A L583-363 L283-722	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	LOCK GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	547A-223 OR AS DETAILED	A	ZER

GATE HARDWARE NO. 6

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	MAMMOTH - 180	CLR A	LOC
1	EA	98L	SERIES	626	VON
1	EA	EXIT DEVICE	LD-AX-98-NL	626	VON
1	EA	CD	CYLINDRICAL DOGGING-22	626	VON
2	EA	PRIMUS CORE	20-740	626	SCH
1	EA	LCN CLOSER	4040XP HEDA	689	LCN
1	EA	KICK PLATE	8400 12" X 2" LDW B-CS	630	IVE

GATE HARDWARE NO. 7 (EXTERIOR SINGLE CLASSROOM DOOR WITH PANIC HARDWARE)

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	PANIC HARDWARE	CDSI-PA-AX-98-NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTICE CYLINDER	20-061 ICX XQ11-948	626	SCH
2	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4040XP HEDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS18L/LFS18S AS REQ'D	BLK	IVE
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	547A-223 OR AS DETAILED	A	ZER

END OF SECTION 08 71 00

SECTION 08 80 00 GLAZING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
1. Float glass.
2. Tempered glass.
3. Reflective glass.
4. Spandrel coated glass.
5. Insulated glass.
6. Laminate glass.
7. Fire protective glazing
8. Fire resistive glazing
9. Spandrel glazing.
10. Glazing sealants.
11. Glass film overlay.
12. Insulated metal panel.
13. Glass Wall Cladding
14. Accessories necessary for a complete installation.

1.3 DEFINITIONS

A. Glass Thickness: Indicated by thickness designations in millimeters according to ASTM C1036.

B. Interspace: Space between lites of an insulating glass unit.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design glass panels including comprehensive engineering analysis by a qualified professional engineer lawfully licensed in the State of California, using performance requirements and design criteria indicated.

B. Installed Glazing: Design glazing systems to withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

C. Structural Performance:
1. Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the CBC and ASTM E1300:
a. Design Wind Pressures: Indicated on Structural Drawings.
b. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE 7, based on heights above grade indicated on Drawings:
1) Wind Design Data: As indicated on Drawings.
2) Basic Wind Speed: 115 mph.

3) Importance Factor: 1.0.

2. Exposure Category: D.
3. Design Snow Loads: Indicated on Drawings.
4. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.
5. Probability of Breakage for Sloped Glazing: For glass surfaces sloped more than 15 degrees from vertical, design glass for a probability of breakage not greater than 0.001.
6. Maximum Lateral Deflection: For glass supported on all four edges, limit center of glass deflection at design wind pressure to not more than 1/50 times the short side length or 1 inch (25 mm), whichever is less.

D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

E. Security Glazing: Where security glazing is indicated, provide glazing that complies with ASTM F1233 Class 1.4 and HP White 5-aa1 rated for duration greater than 7 minutes.

F. Thermal and Optical Performance Properties:
1. Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
a. For monolithic glass lites, properties are based on units with lites 6 mm thick.
b. For laminated glass lites, properties are based on products of construction indicated.
c. For insulating glass units, properties are based on units of thickness indicated for overall unit and for each lite.
d. U-Factors: Center of glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
e. Solar Heat Gain Coefficient and Visible Transmittance: Center of glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
f. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

1.5 SUBMITTALS

A. Product Data: Technical data for each type of product including recommended installation and cleaning procedures.

B. Glass Samples: For each type of glass required. Prepare samples from same material to be used for Work.

C. Glazing Schedule: List glass types and thickness for each size opening and location. Use same designations indicated on Drawings.

D. Delegated Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Product Certificates:
1. Submit glass product certificates required by Code:
a. Glass Manufacturer Certificate: The glass manufacturer shall submit a letter certifying it has reviewed the glazing details proposed for the project, including the use of gaskets and sealants, and that each product furnished is recommended for the application shown and compliance with the Code.

F. Thermal Stress and Wind Load Analyses:
   1. Submit the following from the glass manufacturer:
      a. Thermal stress analysis for each exterior glass unit type, each building elevation. The analysis shall clearly indicate the expected service temperature ranges and the effects of partial and full shading on the glass:
         1) Attach to the thermal stress analysis a statement from the glass manufacturer that based upon this analysis that the resulting thermal stresses will not reduce the specified statistical probability of breakage.

   2. Wind load analysis for each glass unit type, each building elevation. The analysis shall indicate the statistical probability of breakage at the design wind pressure does not exceed the specified statistical probability of breakage.

G. Product Test Reports:
   1. Submit test reports for insulating glass and glazing sealants, for tests performed by a qualified testing agency:
      a. Glazing Sealants: Provide test reports based on testing current sealant formulations within previous 36 month period.
      b. Glazing Sealants: Preconstruction adhesion and compatibility test report.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with applicable requirements of the CBC for glazing.
   2. Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies:
      a. As a minimum provide Category II materials complying with testing requirements in 16 CFR 1201 (Consumer Product Safety Commission *Safety Standard for Architectural Glazing Materials*, published in the Code of Federal Regulations) and ANSI Z97.1.
      b. Permanently mark safety glass with certification label of Safety Glazing Certification Council.
   3. Insulating Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
   4. Comply with published recommendations of glass product organizations:
      a. GANA: Glazing Manual.
      b. IGMA: SIGMA TM-3000 Vertical Glazing Guidelines.
      c. GANA: Laminated Glazing Reference Manual.
      d. AAMA: AAMA GDSG-1 Glass Design for Sloped Glazing.
      e. AAMA: TIR A7 Sloped Glazing Guidelines.
      f. IGMA for Sloped Glazing: IGMA TB-3001 Guidelines for Sloped Glazing.
      g. IGMA for Insulating Glass: SIGMA TM-3000 North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use.
   5. Fire Rated Door Assemblies: Assemblies complying with NFPA 80 listed and labeled by UL for fire ratings indicated, based on testing according to NFPA 252.
   6. Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated:
      a. Minimum Glass Thickness for Exterior Lites: 1/4 inch (6 mm).
      b. Thickness of Tinted Glass: Provide same thickness for each tint color indicated.
   7. Where annealed float glass is indicated, provide annealed float glass, heat strengthened float glass, or fully tempered float glass necessary to comply with performance requirements:
      a. Where heat strengthened float glass is indicated, provide heat strengthened float glass or fully tempered float glass necessary to comply with performance requirements.

b. Where fully tempered float glass is indicated, provide fully tempered float glass.

B. Manufacturer Qualifications for Insulating Glass Units with Sputter Coated, Low E Coatings: Insulating glass manufacturer who is approved and certified by coated glass manufacturer.

C. Installer Qualifications, Glazer: Experience entity having minimum 5 years documented experience and who employs glass installers certified under the National Glass Association's Certified Glass Installer Program.

D. Installer Qualifications, Decorative Film: Experience entity having minimum 5 years documented experience in the installation of glass films.

E. Source Limitations for Glass and Glass Accessories: Obtain each type of glass and glass accessories from a single source.

F. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

G. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

H. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

I. Install glazing in mockups specified to match glazing systems required for Project, including glazing methods:
   1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

J. Preconstruction Adhesion and Compatibility Testing:
   1. Test each glass product, tape sealant, gasket, glazing accessory, and glass framing member for adhesion to and compatibility with elastomeric glazing sealants:
      a. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
      b. Use ASTM C1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
      c. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
      d. Schedule enough time for testing and analyzing results to prevent delaying the Work.
      e. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

K. Pre-installation Conference: Conduct conference at site.

1.7 WARRANTY

A. Written warrant, executed by glass manufacturer agreeing to repair or replace **glass** units that fail in materials and workmanship or deteriorate within warranty period. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to decorative glass manufacturer's published instructions:
   1. Warranty Period: Five (5) years from date of Substantial Completion.

B. Written warranty signed by manufacturer in which glass manufacturer agrees to replace **coated glass** units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating:
   1. Warranty Period: Ten (10) years from date of Substantial Completion.

C. Written warranty signed by manufacturer in which manufacturer agrees to replace **laminated glass** units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard:
   1. Warranty Period: Ten (10) years from date of Substantial Completion.

D. Written warranty signed by manufacturer in which manufacturer agrees to replace **insulating glass** units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass:
   1. Warranty Period: Ten (10) years from date of Substantial Completion.

E. Written warranty signed by **glass film** manufacturer and installer in which manufacturer and installer agree to replace glass film that crack, peel, delaminate, discolor, change appearance, or failure to meet solar criteria within specified warranty period:
   1. Warranty Period: Five (5) years from date of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by manufacturer.

D. Exercise exceptional care to prevent edge damage to glass, and damage/deterioration to coating on glass.

E. Comply with insulating glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers are subject to compliance with requirements; provide products by one of the following:
   1. Glass:
      a. Vitro Architectural Glass (Basis of Design).

b. AGC Glass Company North America, Inc.
c. Cardinal Glass Industries.
d. Guardian Industries Corp.;
e. Pilkington North America.
f. Viracon.

2. Fire Protection Rated Glazing:
   a. Pyran Platinum by McGrory Glass
   b. SAFTI FIRST Fire Rated Glazing Solutions.
   c. Technical Glass Products
3. Fire Resistive rated glazing
   a. AGC Pyrobel by McGrory Glass
4. Security Glazing
   a. DefendED by McGrory Glass
5. Glass Film:
   a. 3M Construction Markets Division. http://www.3m.com
   b. Bekaert Specialty Films. http://www.solargard.com
   c. Madico.http://www.madico.com

B. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.

C. Ultraclear Float Glass: ASTM C1036, Type I, Class I (clear), Quality-Q3.

D. Tinted Annealed Float Glass: ASTM C1036, Type I, Class 2 (tinted), Quality-Q3.

E. Fully Tempered Float Glass:
   1. ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3:
      a. Fabrication Process: By horizontal (roller hearth) process with roll wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

F. Heat Strengthened Float Glass:
   1. ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3:
      a. Fabrication Process: By horizontal (roller hearth) process with roll wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

G. Pyrolytic Coated, Low Maintenance Glass: Clear float glass with a coating on first surface having both photocatalytic and hydrophilic properties that act to loosen dirt and to cause water to sheet evenly over the glass instead of beading.

H. Ceramic Coated Vision Glass: ASTM C1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in GANA *Engineering Standards Manual*.

I. Pyrolytic Coated, Low Maintenance Glass: Clear float glass with a coating on first surface having both photocatalytic and hydrophilic properties that act to loosen dirt and to cause water to sheet evenly over the glass instead of beading.

J. Ceramic Coated Vision Glass: ASTM C1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in GANA *Engineering Standards Manual*.

K. Silicone Coated Spandrel Glass: ASTM C1048, Type I, Condition C, Quality-Q3.

L. Reflective Coated Spandrel Glass: ASTM C1376, Kind CS.

M. Glass Film Overlay: Translucent, dimensionally stable, cast PVC film, 2 mil (0.05 mm) minimum thickness, with pressure sensitive, clear adhesive back for adhering to glass and releasable protective backing.

2.2 LAMINATED GLASS

A. ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation:
   1. Construction: Laminate glass with cast in place and cured transparent resin interlayer to comply with interlayer manufacturer's written instructions.
   2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
   3. Interlayer Thickness: 0.090 inch (2.29 mm).
   4. Interlayer Color: Clear unless otherwise indicated.

B. Windborne Debris Impact Resistant Laminated Glass: Comply with requirements for laminated glass except laminate glass with ionomeric polymer interlayer to comply with interlayer manufacturer's written instructions:

2.3 SECURITY GLASS

A. Glazing Publications: Comply with published recommendations of security glazing and glazing material manufacturers and organizations below unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
   2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. ASTM F1233. Standard Test Method for Security Glazing Materials and Systems.
   1. ASTM C1172 Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation:
   2. Construction: Laminate glass with cast in place and cured transparent polymer interlayer to comply with interlayer manufacturer's written instructions.
   3. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
   4. Interlayer Thickness: .120 inch (3.05 mm).
   5. Interlayer Color: Clear unless otherwise indicated.

C. Security Glazing Labeling: Where security glazing is indicated, permanently mark glazing with certification label of the Glazing Certification Council. Label shall indicate manufacturer's name, type of glazing, glass thickness, and safety glazing standard with which glazing complies.

2.4 INSULATING GLASS

A. Factory assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E2190.

B. Performance Properties:
   1. Basis of Design Product: Vitro Architectural Glass: Tint Color **Solargray**
   2. Overall Unit Thickness: 1 inch (25 mm).
   3. Minimum Thickness of Each Glass Lite: 1/4 inch (6 mm).

4. Outdoor Lite: Fully tempered float glass.
5. Interspace Content: Air.
6. Indoor Lite: Fully tempered float glass.
7. Safety glazing required.

C. Sealing System:
1. Dual seal, with polyisobutylene and silicone primary and secondary sealants:
   a. Spacer: Aluminum with black, color anodic finish. Thermally broken aluminum.
   b. Manufacturers: Subject to compliance with requirements, provide products by Technoform Glass Insulation NA, Inc.
   c. Desiccant: Molecular sieve or silica gel, or a blend of both.

D. Fire Protection Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire protection ratings indicated, based on positive pressure testing according to NFPA 257 or UL 9, including the hose stream test, and complying with NFPA 80. For ratings 60 minutes or greater, glazing shall meet the test requirements of ASTM E119 or UL 263.

E. Fire Protection Rated Glazing Labeling: Permanently mark fire protection rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction indicating manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether or not glazing has passed the hose-stream test; whether or not glazing meets 450 degrees F (250 degrees C) temperature rise limitation; and the fire resistance rating in minutes.

F. Film Faced Ceramic Glazing: Clear, ceramic flat glass; 5 mm thickness; faced on one surface with a clear glazing film; and complying with 16 CFR 1201, Category II.

2.5 GLASS FILM

A. Performance Requirements:
1. Scratch resistant coating that, after fully cured, facilitates cleaning without damaging or scratching film.
2. Optical Distortion: When viewed from a distance of 10 feet at angles up to 45 degrees from either side of the glass, there is no discernable distortion.
3. Edges: Seal edges except when the film is applied with a lacquer that prevents moisture or free water from penetrating between the film and the glass.

B. Provide coating with uniform finish, without noticeable pin holes, streaks, thin spots, scratches, or banding:
1. Light Transmission:
   a. Maximum Variation across Width and Length: Not to exceed 1 percent.
   b. Variation in Transmission across Width and Length: Not to exceed 2 percent.

C. Rate of Change of Total Transmission across Width and Length: Not to exceed 1 percent in 4 inches.

2.6 GLASS WALL CLADDING

A. Fully Assembled glass mounting system (on glass panels) and receiving rails ready to be mounted on backup structure to be provided by single-source and sole manufacturer.

B. Assembled patented glass mounting system must be fully framed unitized construction utilizing extruded aluminum horizontal and vertical rails. The assembly is secured into place via horizontal rails fastened to the backup structure. The horizontal and vertical rails are

structurally bonded to the back of the glass panel with a minimum of 1 square inch of distributed load sharing per lineal inch of metal attachment. Horizontal rails and vertical rails are mechanically fastened together:

1. In a plug and play fashion with tolerance of +/- < 0.005”
2. Utilizing 2 or more mechanical fasteners at each joining location
3. With at least 1” of bite per each fastener

C. Vertical rails must be made, tested, and engineered to:
1. Ensure that the glass panel dead load is shared equally between all horizontal rails
2. Enable the dead load of the full assembly to be fully supported on one single upper horizontal rail which is fixed to the backup structure.

D. Glass mounting system design loads:
1. Short term tension stress or shear stress shall not exceed 20 psi.
2. Long term stress shall not exceed 1 psi.

E. Glass mounting system design loads when a fully finite element analysis is used:
1. Short term tension or shear stress shall not to exceed 24 psi.
2. Long term stress shall not exceed 2 psi.

F. Structural Adhesive Properties:
1. Ultimate Tensile Strength <295 psi (ASTM D 412)
2. Ultimate Elongation of at least 120 % (ASTM C 1135)
3. Movement Capability +/- 24% (ASTM C 719)
4. VOC Content IN FACTORY of < 20 g/L
5. VOC Content IN FIELD < 0.5 g/L

G. Each horizontal rail must have two or more linear continuous engagements running parallel to each other, with at least ¾” overlap and allow horizontal reveals as small as 3/16” while retaining the ability to remove any panel, any place, and at any time without the need to move any other panel to enable any such removal. Each horizontal wall rail must have multiple horizontal ridges separated by approximately 1/16” acting as a screw guide to assist in locating rail on wall

H. Reveals/Joints between panels to be addressed on a project by project basis.

I. Manufacturer of system must:
1. Show they have a right to utilize the design and are not infringing on any other manufacturer’s patent
2. Provide test reports showing chemical and physical compatibility of any adhesives utilized in construction; if required
3. Provide stamped engineered drawings including a three axis finite elements analysis of the system and each individual decorative glass module
4. Assemble and attach glass mounting system to glass in a fully climate-controlled manufacturing facility
5. Supply fully assembled glass mounting system (on glass panels) and furnish receiving rails ready to be mounted on backup structure (single-source/sole manufacturer).
6. Specify fastener, method, and shimming guidelines to be followed.

J. CAPTIVEHOOK® GLASS MOUNTING SYSTEM- Seismic Application Option when Required
1. Provide proof of AAMA 501.6 compliance as required
2. System in a multiple panel configuration of at least four individual panels and spanning at least 8’ wide by 20’ tall must have been found AAMA 501.6 seismic compliant by at least one industry recognized third-party testing facility
3. During dynamic earthquake racking testing, no glass and or any other part of the

system totaling more than 1 square inch may have fallen from the wall.

4. Reveals/Joints between panels to be addressed on a project by project basis.

2.7 GLAZING ACCESSORIES

A. Compatibility: Provide glazing sealants compatible with one another and with other materials in contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of service and application, demonstrated by sealant manufacturer based on testing and field experience.

B. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

C. Colors of Exposed Glazing Sealants: Selected by Architect.

D. Glazing Sealant - Neutral curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 100/50, Use NT:
   1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      a. Dow Corning Corporation.
      b. GE Construction Sealants; Momentive Performance Materials Inc.
      c. May National Associates, Inc.; a subsidiary of Sika Corporation.
      d. Pecora Corporation.
      e. Sika Corporation.

E. Glazing Sealant - Neutral curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 50, Use NT:
   1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      a. BASF Corporation; Construction Systems.
      b. Dow Corning Corporation.
      c. GE Construction Sealants; Momentive Performance Materials Inc.
      d. May National Associates, Inc.; a subsidiary of Sika Corporation.
      e. Pecora Corporation.
      f. Polymeric Systems, Inc.
      g. Sika Corporation.

F. Glazing Sealant - Neutral curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 25, Use NT:
   1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      a. Bostik, Inc.
      b. Dow Corning Corporation.
      c. GE Construction Sealants; Momentive Performance Materials Inc.
      d. May National Associates, Inc.; a subsidiary of Sika Corporation.
      e. Polymeric Systems, Inc.
      f. Schnee-Morehead, Inc., an ITW company.
      g. Sika Corporation.

G. Glazing Sealant - Acid curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 25, Use NT:
   1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      a. BASF Corporation; Construction Systems.

b. Bostik, Inc.
c. Dow Corning Corporation.
d. GE Construction Sealants; Momentive Performance Materials Inc.
e. May National Associates, Inc.; a subsidiary of Sika Corporation.
f. Pecora Corporation.
g. Polymeric Systems, Inc.
h. Schnee-Morehead, Inc., an ITW company.
i. Sika Corporation.

H. Glazing Sealants for Fire rated Glazing Products - Neutral curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 50, Use NT. Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated:
1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
a. Dow Corning Corporation.
b. GE Construction Sealants; Momentive Performance Materials Inc.
2. Colors of Exposed Glazing Sealants: Selected by Architect.

I. Back Bedding Mastic Glazing Tapes:
1. Preformed, butyl based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
a. Tape, where indicated.
b. Tape, for glazing applications in which tape is subject to continuous pressure.
c. Tape, for glazing applications in which tape is not subject to continuous pressure.

J. Expanded Cellular Glazing Tapes:
1. Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
a. Type 1, for glazing applications in which tape acts as the primary sealant.
b. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

K. Miscellaneous Glazing Accessories:
1. Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with proven record of compatibility with surfaces contacted in installation:
a. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
b. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
c. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
d. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
e. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
f. Perimeter Insulation for Fire Resistive Glazing: Product approved by testing agency listed and labeled fire resistant glazing product with which it is used for application and fire protection rating indicated.

2.8 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements:
   1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components:
      a. Temperature Change: 120 degrees F (67 degrees C), ambient; 180 degrees F, material surfaces.
   2. Edge and Surface Conditions: Comply with the recommendations of AAMA *Structural Properties of Glass* for clean cut edges, except comply with manufacturer's recommendations.
   3. Exposed Glass Edges and Surface Condition: Finish edges flat with an arrissed edge profile (small bevel of uniform width not exceeding 1.5 mm at an angle of approximately 45 degrees to the surface of the glass) with polished (surface is reflective in appearance similar to the major surface of the glass) surface.

B. Cutting: Wheel cut or sawed edges and seamed at manufacturer's option. For site cut glass, provide glass 2 inches larger than required in both dimensions to facilitate cutting of clean cut edges without the necessity of seaming or nipping. Do not cut, seam, nip or abrade heat treated glass.

C. Butt Glazing: Clean cut or flat grind vertical edges of butt glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

D. Edges: Grind smooth and polish exposed glass edges and corners.

2.9 INSULATED METAL INFILL PANELS – SP1

A. Metal Composite Material Wall Panel System:
   1. Basis of Design:
      a. Product/Manufacturer: 8200 System as manufactured by NOW Specialties Inc., Carrollton, Texas 75006:
         1) Other manufacturers listed below are to provide factory-formed and assembled, metal composite material panels fabricated from two metal facings that are bonded to a solid, extruded thermoplastic core; formed into profile for installation with existing aluminum storefront system and new aluminum storefront system. Include attachment assembly components, panel stiffeners, and accessories required for weathertight system.
         2) Manufacturers are subject to compliance with requirements; provide products by one of the following:
            a) Alucobond, manufactured by 3A Composites USA, Inc., Benton, KY 42025.
            b) Alpolic, Mitsubishi Plastics Composites America, Inc., Chesapeake, VA 23320
            c) Reynobond, Alcoa Architectural Products, Eastman GA 31023.

B. Composite Panels:
   1. Aluminum-faced panel with thermoplastic core:
      a. Overall Panel thickness: 1 inch.
      b. Aluminum-Face: 0.0197 inches, with strippable protective film. Protective film: heavy and opaque if required to indicate finish grain direction.
      c. Aluminum Backer Sheet thickness: 0.0197 inches.
      d. Aluminum Alloy: ASTM B209 3003 at coated finish.

C. Composition:

1. Two sheets of aluminum sandwiching core of extruded thermoplastic material formed in continuous process with no glues or adhesives between dissimilar materials. Products laminated sheet by sheet or in batch process using glues or adhesives between materials shall not be acceptable:
    e. Fire-Retardant Core (where required by CBC): Complies with NFPA 285, with the following surface-burning characteristics as determined by testing identical products per ASTM E84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
        1) Flame-Spread Index: 15 or less.
        2) Smoke-Developed Index: 105 or less.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Environmental Limitations:
    1. Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes:
        a. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 degrees F.

B. Field Measurements: Verify actual dimensions of openings and construction contiguous with decorative glass by field measurements before fabrication.

3.2 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

3.3 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
    1. Manufacturing and installation tolerances, including size, squareness, and offsets at corners.
    2. Presence and functioning of weep systems.
    3. Minimum required face and edge clearances.
    4. Effective sealing between joints of glass-framing members.

B. Proceed with installation after correcting unsatisfactory conditions.

3.4 PREPARATION

A. Clean glazing channels and framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates:
    1. Comply with manufacturer instructions for wiping of surfaces immediately before application of primers.
    2. Wipe metal surfaces with IPA (isopropyl alcohol) unless otherwise required by compatibility and adhesion testing results.

B. Inspect each piece of glass immediately before installation. Do not install pieces improperly sized or with damaged edges, scratches, abrasion, or evidence damage. Remove labels from glass immediately after installation.

C. Examine glazing units to locate exterior and interior surfaces. Label or mark units so exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

D. Seal vent (breather or capillary) tubes in insulating glass units in accordance with insulating glass manufacturer written recommendations.

E. Glass Film Preparation:
   1. Remove particulate matter on the glass surface using a scraping blade.
   2. Place an absorbent towel on window sill or sash to absorb moisture generated by the film application.

3.5 GLAZING

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm):
   1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
   2. Provide 1/8 inch (3 mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

J. Where wedge shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement:
   1. Square cut wedge shaped gaskets at corners and install gaskets as recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

K. Tape Glazing:
   1. Position tapes on fixed stops so that, when compressed by glass, the exposed edges are flush with or protrude slightly above sightline of stops:
      a. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make tapes fit opening.
      b. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
      c. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
      d. Do not remove release paper from tape until right before each glazing unit is installed.
      e. Apply heel bead of elastomeric sealant.
      f. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
      g. Apply cap bead of elastomeric sealant over exposed edge of tape.

L. Gasket Glazing (Dry):
   1. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation:
      a. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
      b. Installation with Drive in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
      c. Installation with Pressure Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
      d. Install gaskets to protrude past face of glazing stops.

M. Sealant Glazing (Wet):
   1. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance:
      a. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
      b. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

N. Erection Tolerances:
   1. Maximum Deviation from Vertical: 1/8 inch in any story and 1/4 inch in any 45 foot run.
   2. Maximum Deviation from Horizontal: 1/8 inch in any 30 foot run.
   3. Maximum Deviation from True Alignment: 1/32 inch for any two (2) abutting units.

Allow no edge projections.

4. Maximum Joint Gap: 1/32 inch.

O. Insulating-Glass Unit(s)
1. Double Glazed Tinted Solar Control Insulating Glass Unit Solarban® 60 on Solargray® 6mm (2) | Air 1/2" (12.7mm) | Clear 6mm:
   a. Conformance: ASTM E2190.
   b. Outdoor Lite: Solargray® Tinted Float Glass as manufactured by Vitro Architectural Glass:
      1) Conformance: ASTM C1036, Type 1, Class 2, Quality q3.
      2) Glass Thickness: 6mm (1/4")
      3) Magnetic Sputter Vacuum Deposition Coating (MSVD): ASTM C1376.
      4) Coating: Solarban® 60 on Surface # 2
      5) Heat-Treatment: [None] [Heat-strengthened, ASTM C1048, Kind HS] [Tempered; ASTM C1048, Kind FT; Safety Glazing meets ANSI Z97.1 and CPSC 16CFR-1201] Specifier Notes: Specify the method of heat treatment. Vitro recommends that heat strengthened glass be specified and used, except where tempered glass is mandated for safety or other purposes by code.
   c. Interspace Content: Air 1/2" (12.7mm)
   d. Indoor Lite:
      1) Clear float glass as manufactured by Vitro Architectural Glass:
         a) Conformance: ASTM C1036, Type 1, Class 1, Quality q3.
         b) Heat-Treatment: [None] [Heat-strengthened, ASTM C1048, Kind HS] [Tempered; ASTM C1048, Kind FT; Safety Glazing meets ANSI Z97.1 and CPSC 16CFR-1201] Specifier Notes: Specify the method of heat treatment. Vitro recommends that heat strengthened glass be specified and used, except where tempered glass is mandated for safety or other purposes by code.
         c) Glass Thickness: 6mm (1/4")
   e. Performance Requirements:
      1) Visible Light Transmittance: 35 percent minimum.
      2) Winter Nighttime U-Factor: 0.29 (Btu/hr*ft2*°F) maximum.
      3) Summer daytime U-Factor: 0.27 (Btu/hr*ft2*°F) maximum.
      4) Shading Coefficient: 0.29 maximum.
      5) Solar Heat Gain Coefficient: 0.25 maximum.
      6) Outdoor Visible Light Reflectance: 9 percent maximum.

3.6 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains:
1. If contaminating substances come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

PART 4 SCHEDULE

4.1 GLAZING SCHEDULE

A. G-1 Insulated Glass: 1 inch (25 mm) sealed insulated unit consisting of an exterior lite of 1/4 inch (6 mm) low-e tinted tempered float glass, 1/2 inch gas filled air space, and 1/4 inch (6 mm) clear tempered float glass interior lite.

B. G-2 Tinted Tempered Glass: 1/4 inch (6 mm) tinted tempered glass.

C. G-3 Clear Tempered Glass: 1/4 inch (6 mm) clear tempered float glass.

D. G-4 Annealed Float Glass: Not Used.

E. G-5 Fire Rated Glass: 1/4 inch (6 mm) ceramic, premium clear fire rated glass; 45 minute UL labeled for hose stream and positive pressure. Rated for impact safety in accordance with CPSC 16CFR 1201 Cat. II (400 foot pounds).

F. G-6 Acoustic Glazing: Glass unit consisting of 1/4 inch (6 mm) tempered glass laminated to 3/8 inch (9 mm) clear float glass comprised of two 3/16 inch (4.5 mm) clear float glass lites laminated to each other with clear 0.060 inch thick polyvinyl butyral (PVB) interlayer.

G. G-7 Laminated Glass: 6 mm (1/4 inch) clear laminated safety glass comprised of two 1/8 inch (3 mm) clear float glass lites, laminated to each side of a clear 0.030 inch thick polyvinyl butyral (PVB) interlayer.

H. G-10 Insulated Spandrel Glass: 1 inch (25 mm) sealed insulated unit consisting of an exterior lite of 6 mm (1/4 inch) spandrel glass with a ceramic frit on interior face (#2 surface on exterior lite), 1/2 inch air space, and 1/4 inch (6 mm) clear tempered float glass interior lite.

I. SG-1 Security Glazing: 7/16” clear laminated security glazing comprised of 2 layers of 1/8 inch (3mm) heat strengthened glass with a proprietary attack-resistant interlayer. DefendED by McGrory Glass basis of design or pre-bid approved equal.

J. SG-2 Security Glazing: 1” clear laminated security glazing comprised of 2 layers of 1/8 inch (3mm) heat strengthened glass with a proprietary attack-resistant interlayer, insulated to ¼” (6mm) low-e tempered float glass with a hermetically sealed airspace and a secondary silicone seal. DefendED IGU by McGrory Glass basis of design or pre-bid approved equal.

END OF SECTION 08 80 00

SECTION 08 83 00 MIRRORS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Tempered glass mirrors qualifying as safety glazing.
   2. Accessories necessary for a complete installation.

B. Related Sections:
   1. Section 06 10 53: Miscellaneous Rough Carpentry
   2. Section 08 80 00: Glazing.

1.3 DEFINITIONS

A. Deterioration of Mirrors: Defects developed from normal use attributable to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning mirrors contrary to mirror manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1.4 PERFORMANCE REQUIREMENTS

A. Provide mirrors that will not fail under normal usage. Failure includes glass breakage and deterioration attributable to defective manufacture, fabrication, and installation.

1.5 SUBMITTALS

A. Product Data: Technical data for mirror units including description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality control provisions.

B. Shop Drawings: Submit mirror elevations, edge details, mirror hardware, and attachments to other work.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Accessibility Requirements - Comply with applicable requirements:
      a. U.S. Architectural and Transportation Barriers Compliance Board Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) 2010.
      b. ICC/ANSI A117.1 Accessible and Useable Building and Facilities.
      c. CBC 11B.
   2. Glazing Publications - Comply with published recommendations:
      a. GANA *Glazing Manual* unless more stringent requirements are indicated.
      b. GANA Mirror Division Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors.
   3. Safety Glazing Products: For tempered mirrors, provide products complying with testing requirements in 16 CFR 1201 for Category II materials.

B. Installer Qualifications: Experienced installer having minimum 5 years documented experience and has completed mirror glazing similar in material, design, and extent to that indicated.

C. Source Limitations for Mirrors: Obtain mirrors from one source for each type of mirror indicated.

D. Source Limitations for Mirror Glazing Accessories: Obtain mirror glazing accessories from one source for each type of accessory indicated.

E. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing and substrates on which mirrors are installed.

1.7 WARRANTY

A. Warranty: Warranty made out to Owner and signed by mirror manufacturer agreeing to replace mirrors that deteriorate, f.o.b. the nearest shipping point to site, within specified warranty period:
   1. Warranty Period: Five years from date of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect mirrors according to mirror manufacturer's written instructions and necessary to prevent damage to mirrors from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors, protected from moisture including condensation.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers: Subject to compliance with requirements, provide mirrors by one of the following:
   1. Guardian Industries Corp.
   2. Arch Aluminum & Glass Co., Inc.
   3. Virginia Mirror Company, Inc.
   4. VVP America, Inc.; Binswanger Mirror Products.
   5. Walker Glass Co., Ltd.

B. Tempered Glass Mirrors: Comply with ASTM C1503, Mirror Glazing Quality, for blemish requirements in annealed float glass before silver coating is applied, for coating requirements, and with other requirements not affected by tempering process; and comply with ASTM C1048 for Kind FT, Condition A, tempered float glass before silver coating is applied.
   1. Nominal Thickness: 6.0 mm.
   2. Safety Glazing Products: For tempered mirrors, provide products that comply with 16 CFR 1201, Category II.

C. Setting Blocks: Elastomeric material with Type A Shore durometer hardness of 85, plus or minus 5.

D. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

E. Mirror Mastic: Adhesive setting compound, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed. Provide product recommended by mirror manufacturer.

F. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

G. Top and Bottom Aluminum J-Channels:
1. Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece:
   a. Bottom Trim - J-channels formed with front leg and back leg not less than 3/8 inch and 7/8 inch (9.5 mm and 22 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm):
      1) Products are subject to compliance with requirements; provide one of the following:
         a) Laurence, C. R. Co., Inc.; CRL Standard "J" Channel.
         b) Sommer & Maca Industries, Inc.; Aluminum Shallow Nose "J" Moulding Lower Bar.
2. Top Trim:
   a. J-channels formed with front leg and back leg not less than 5/8 and 1 inch (16 and 25 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm):
      1) Products are subject to compliance with requirements; provide one of the following:
         a) Laurence, C. R. Co., Inc.; CRL Deep "J" Channel.
         b) Sommer & Maca Industries, Inc.; Aluminum Deep Nose "J" Moulding Upper Bar.
3. Finish: Clear.

H. Top and Bottom Clips: As indicated.

I. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

J. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead shield expansion bolt devices for drilled in place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.2 FABRICATION

A. Mirror Sizes: To suit conditions, and before tempering, cut mirrors to final sizes and shapes.

B. Cutouts: Fabricate cutouts for notches and holes in mirrored glass without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrored glass.

C. Mirror Edge Treatment:
1. Cutting and Polishing: Flat edges where the clean-cut square edge of the glass is flat and surface edges are slightly arrissed. After grinding the arisses, polish edges to a high gloss surface where the surface reflectivity is similar in appearance to the major surface of the glass.

2. Edge Sealing: Immediately after cutting to final sizes, and applying edge treatment, factory seal edges of mirrors with edge sealer to prevent chemical or atmospheric penetration of glass coating.

D. Film Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint as recommended in writing by film backing manufacturer to produce a surface free of bubbles, blisters, and other imperfections.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

3.2 EXAMINATION

A. Examine substrates, over which mirrors are to be mounted for compliance with installation tolerances, substrate preparation, and conditions affecting performance. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers. Proceed with mirror installation after unsatisfactory conditions have been corrected and surfaces are dry.

3.3 PREPARATION

A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating surfaces with mastic manufacturer's special bond coating where applicable.

3.4 INSTALLATION

A. Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images. Provide minimum air space of 1/8 inch (3 mm) between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.

B. Wall Mounted Mirrors: Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors:
   1. For metal or plastic clips, place a felt or plastic pad between mirror and each clip to prevent spalling of mirror edges.
   2. Top and Bottom Aluminum J-Channels: Provide setting blocks 1/8 inch (3 mm) thick by 4 inches (100 mm) long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch (6.4 mm) wide by 3/8 inch (9.5 mm) long at bottom channel.
   3. Mirror Clips - Place a felt or plastic pad between mirror and each clip to prevent spalling of mirror edges. Locate clips to be symmetrically placed and evenly spaced:
      a. Fabricate bottom trim in single lengths to fit and cover bottom edges of mirrors. Locate top clips so they are symmetrically placed and evenly spaced.
   4. Mastic - Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface:
      a. Apply mastic in vertical beads or mounds to the wall, not to the mirror back to avoid

potential damage caused by mastic applicator tools, in compliance with mastic manufacturer's written instructions to allow air circulation between back of mirrors and face of mounting surface.

b. Make each vertical bead approximately 1/2 inch in width with minimum of one bead for every square foot of mirror.
c. Make each mound approximately 1-1/2 inch in diameter with a minimum of one mound for every square foot of mirror.
d. Do not apply mastic within 6 inches of the mirror edges to prevent squeeze out. Place beads or mounds leaving a space between mirror and wall. After mastic is applied, align mirrors and press into place. Spread each vertical bead to approximately 2 inches in width and spread each mound to a pat approximately 3-1/2 inch in diameter after pressing mirror into place.
e. After mastic is applied, align mirrors and press into place while maintaining a minimum air space of 1/8 inch (3 mm) between back of mirrors and mounting surface.

3.5 CLEANING AND PROTECTION

A. Protect mirrors from breakage and contaminating substances resulting from construction operations. Do not permit edges of mirrors to be exposed to standing water. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

B. Wash exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 08 83 00

SECTION 09 21 16 GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Gypsum Board.
   2. Reinforced Gypsum Board Sheathing (Tile Backer Board).
   3. Cementitious Backer Units.
   4. Impact Resistant Gypsum Board.
   5. Accessories necessary for a complete installation.

B. Related Sections:
   1. Section 06 10 00: Rough Carpentry.
   2. Section 08 11 13: Hollow Metal Doors and Frames.
   3. Section 08 31 13: Access Door and Frames.
   4. Section 08 51 13: Aluminum Windows.
   5. Section 09 90 00: Painting and Coating.

1.3 PERFORMANCE REQUIREMENTS

A. Comply with manufacturer's load tables and the following design pressures and deflections:
   1. Stairs, Elevator Hoistways, and Vertical Shafts: 1/120 at 10 psf.
   2. Ground Floor Lobbies: 1/120 at 15 psf.
   3. Partitions Receiving Stone Cladding, Lath and Plaster, or Plaster Veneer: 1/360 at 15 psf.
   4. Partitions Receiving Monitors, Televisions, Heavy Audio/Visual Equipment: 1/360 at 15 psf.
   5. Typical Partitions: 1/240 at 5 psf.
   6. Other Partitions: 1/240 at 5 psf.:
      a. Maximum Deflection:
         1) L/240 at 5 lbf per sq. ft.
         2) L/120 at 5 lbf per sq. ft.
         3) L/120 at 7.5 lbf per sq. ft.
         4) L/120 at 10 lbf per sq. ft.

B. Fire Resistance Rated Assemblies: For fire resistance rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

C. STC Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

1.4 SUBMITTALS

A. Product Data: Submit For each type of drywall including calculations for loadings and stresses of exterior walls and specially fabricated framing based on manufacturer’s load

tables.

B. Shop Drawings: Indicate locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other units of Work.

C. Samples:
1. Trim Accessories: Full size Sample in 12-inch (300 mm) long length for each trim accessory indicated.
2. Textured Finishes: 12 inches by 12 inches (300 mm by 300 mm) for each textured finish indicated and on same backing indicated for Work.

D. Calculations: Submit calculations verifying steel partition stud minimum base metal thickness and depth compliance with Code and ASTM C645 for height, load, and deflection.

E. Evaluation Reports: ICC-ES reports for dimpled steel studs and runners and firestop tracks.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Comply with applicable requirements of CBC for interior finishes.
2. Fire Resistance Rated Assemblies: For fire resistance rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. Single Source Responsibility:
1. Framing Members: Obtain steel framing members from single manufacturer.
2. Panel Products: Obtain each type of gypsum board and other panel products from single manufacturer.
3. Finishing Materials: To the extent possible, obtain finishing materials from same manufacturer supplying gypsum board products. When not possible, obtain materials from manufacturer acceptable to gypsum board manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers are subject to compliance with requirements; provide products by one of the following:
1. Steel Studs and Tracks:
a. ClarkDietrich
b. CEMCO; California Expanded Metal Products Co.
c. Custom Stud.
d. MBA Building Supplies.
e. MRI Steel Framing, LLC.
f. Phillips Manufacturing Co.

g. SCAFCO Steel Stud Co.
h. Steel Network, Inc. (The).
i. Telling Industries.

2. Ceiling Grid:
   a. Armstrong World Industries, Inc.; Drywall Grid Systems.
   b. Chicago Metallic Corporation; 640-C.
3. USG Corporation; Drywall Suspension System.
4. Gypsum Board:
   a. CertainTeed Corporation.
   b. Georgia Pacific.
   c. National Gypsum Company.
   d. USG Corporation.
5. Tile Backer Board: Fiberock Interior Aqua-Tough; USG Corporation or comparable product.
6. Glass Mat Gypsum Sheathing Board:
   a. CertainTeed Corporation; GlasRoc.
   b. G-P Gypsum Corporation; Dens-Glass Gold.
   c. National Gypsum Company; Gold Bond e(2)XP.
   d. United States Gypsum Co.; Securock.
7. Cementitious Board:
   a. CertainTeed Corporation.
   b. Custom Building Products.
   c. National Gypsum Company.
   d. United States Gypsum Company.

B. Framing Members:
   1. ASTM C754 for component sizes and conditions under specified maximum deflection and lateral loading conditions indicated:
      a. Steel Sheet Components: Comply with ASTM C645 requirements for metal.
      b. Protective Coating: ASTM A653/A653M, G60 (Z180), hot dip galvanized.

C. Steel Framing Components:
   1. ASTM C754 for conditions indicated; hot dip galvanize complying with ASTM A653 Z180:
      a. Steel Studs and Runners: ASTM C645, 0.0179 inch (0.45 mm) minimum base metal thickness; Depth indicated on Drawings.
      b. Dimpled Steel Studs and Runners: ASTM C645, equivalent to minimum base metal thickness indicated on Drawings for depth indicated on Drawings.
      c. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
      d. Cold Rolled Channel Bridging: 0.0538 inch (1.37 mm) bare steel thickness, with minimum 1/2 inch (12.7 mm) wide flanges. Depth indicated on Drawings.
      e. Clip Angle: Not less than 1-1/2 inch by 1-1/2 inch (38.1 mm by 38.1 mm), 0.068-inch (1.73 mm) thick, galvanized steel.
      f. Hat Shaped, Rigid Furring Channels: ASTM C645; 0.0179-inch (0.45 mm) minimum base metal thickness; Depth indicated on Drawings.
      g. Resilient Furring Channels: 1/2-inch (12.7mm) deep, steel sheet members designed to reduce sound transmission. Configuration: Asymmetrical or hat shaped.
      h. Cold Rolled Furring Channels - 0.0538-inch (1.37mm) bare steel thickness, with minimum 1/2-inch (12.7mm) wide flanges:
         1) Depth: Indicated on Drawings.
         2) Furring Brackets: Adjustable, corrugated edge type of steel sheet with minimum bare steel thickness of 0.0312 inch (0.79 mm).
         3) Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.0625-inch (1.59mm) diameter wire, or double strand of 0.0475-inch (1.21mm) diameter

wire.

i. Z Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (31.8 mm), wall attachment flange of 7/8 inch (22.2 mm), minimum bare metal thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.

j. Auxiliary Framing Materials: Fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

k. Slip Type Head Joints - Where indicated, provide one of the following:
   1) Single Long Leg Runner System: ASTM C645 top runner with 2-inch (50.8 mm) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging, located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
   2) Double Runner System: ASTM C645 top runners, inside runner with 2-inch (50.8 mm) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
   3) Deflection Track - Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs. Provide one of the following:
      a) Dietrich Metal Framing; SLP-TRK Slotted Deflection Track.
      b) Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series.
      c) Superior Metal Trim; Superior Flex Track System (SFT).

l. Firestop Tracks:
   1) Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire resistance rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs. Provide one of the following:
      a) Fire Trak Corp.; Fire Trak attached to studs with Fire Trak Slip Clip.
      b) Grace Construction Products; FlameSafe FlowTrak System.
      c) Metal-Lite, Inc.; The System.
      d) Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series as applicable.

D. Ceiling Suspension Components:
   1. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.0625-inch (1.59 mm) diameter wire, or double strand of 0.0475-inch (1.21 mm) diameter wire.
   2. Hanger Attachments to Concrete:
      a. Anchors: Postinstalled, chemical anchor or postinstalled, expansion anchor fabricated from corrosion resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E488 by an independent testing agency.
      b. Powder Actuated Fasteners: Suitable for application indicated, fabricated from corrosion resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E1190 by an independent testing agency.
   3. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12 mm) diameter.
   4. Carrying Channels: Cold rolled, commercial steel sheet with base metal thickness of 0.0538 inch (1.37 mm) and minimum 1/2-inch (12.7 mm) wide flanges. Depth indicated on Drawings.
   5. Furring Channels (Furring Members):
      a. Cold Rolled Channels: 0.0538-inch (1.37 mm) bare steel thickness, with minimum 1/2-inch (12.7 mm) wide flanges, 3/4-inch (19.1 mm) deep.
      b. Steel Studs: ASTM C645; minimum base metal thickness of 0.0312 inch (0.79

mm); Depth indicated on Drawings.
c. Hat Shaped, Rigid Furring Channels: ASTM C645, 7/8-inch (22.2 mm) deep; Minimum base metal thickness of 0.0312 inch (0.79 mm).
6. Resilient Furring Channels: 1/2-inch (12.7 mm) deep members designed to reduce sound transmission. Configuration: Hat shaped.
7. Grid Suspension System for Ceilings: ASTM C645, direct hung system composed of main beams and cross furring members that interlock.

E. Gypsum Board - ASTM C1396/C1396M, applicable to type of gypsum board indicated and whichever is more stringent:
1. Core - Use Type X throughout:
a. Thickness: 5/8 inch (15.9 mm).
b. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
2. Ceiling Type - Manufactured for sag resistance:
a. Thickness: 1/2 inch (13mm).
b. Long Edges: Tapered.
3. Moisture and Mold Resistant Type - Type X with moisture and mold resistant core and surfaces. Core:
a. Thickness: 5/8 inch (15.9 mm).
b. Long Edges: Tapered.

F. Impact Resistant Gypsum Board - ASTM C1396/C1396M gypsum board, tested according to ASTM C1629/C1629M:
1. Core and Thickness: 5/8 inch (15.9 mm), Type X.
2. Surface Abrasion: ASTM C1629/C1629M, meets or exceeds Level 1 requirements.
3. Indentation: ASTM C1629/C1629M, meets or exceeds Level 1 requirements.
4. Soft Body Impact: ASTM C1629/C1629M, meets or exceeds Level 1 requirements.
5. Hard Body Impact: ASTM C1629/C1629M, meets or exceeds Level 1 requirements according to test in Annex A1.
6. Long Edges: Tapered.
7. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

G. Acoustically Enhanced Gypsum Board - ASTM C1396/C1396M. Multilayer products constructed of two layers of gypsum boards sandwiching a viscoelastic sound-absorbing polymer core:
1. Manufacturers are subject to compliance with requirements; provide products by one of the following:
a. National Gypsum Company.
b. Quiet Solution.
2. Core: 1-3/8 inch (35 mm), regular type.
3. Long Edges: Tapered.

H. Reinforced Gypsum Sheathing (Tile Backer Board) - ASTM C1278/C1278M, standard edges. Cellulose fiber reinforced panels may be used in lieu of cementitious board:
1. Core and Thickness: 1/2 inch (12.7 mm) or 5/8 inch (15.9 mm) to match conditions, Type X.
2. Long Edge: Tapered.
3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

I. Glass Mat Gypsum Sheathing Board - ASTM C1177/C1177M, with fiberglass mat laminated to both sides and with standard edges:
1. Core: Type X
2. Thickness: 5/8 inch (15.9 mm).
3. Size: 48 inches by 96 inches (1219 mm by 2438 mm).
4. Long Edges: Tapered.

J. Cementitious Backer Units - ASTM C1288 or ASTM C1325:
   1. Thickness: 1/2 inch (12.7 mm) and 5/8 inch (15.9 mm) to match conditions.
   2. Long Edges: Standard.
   3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

K. Exterior Gypsum Board For Ceilings and Soffits:
   1. Glass Mat Gypsum Sheathing Board: ASTM C1177/C1177M, with fiberglass mat laminated to both sides and with standard edges.
   2. Core: 5/8 inch (15.9 mm), Type X.

L. Exterior Trim - ASTM C1047, hot dip galvanized steel sheet, plastic, or rolled zinc:
   1. Shapes:
      a. Cornerbead.
      b. LC Bead: J shaped; exposed long flange receives joint compound.
      c. Expansion (Control) Joint: One piece, rolled zinc with V shaped slot and removable strip covering slot opening.

M. Interior Trim - ASTM C1047; galvanized or aluminum coated steel sheet, rolled zinc, plastic, or paper faced galvanized steel sheet:
   1. Shapes:
      a. Cornerbead.
      b. Bullnose bead.
      c. LC Bead: J shaped; exposed long flange receives joint compound.
      d. L Bead: L shaped; exposed long flange receives joint compound.
      e. U Bead: J shaped; exposed short flange does not receive joint compound.
      f. Expansion (control) joint.
   2. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      a. Pittcon Industries.
      b. Fry Reglet Corp.
      c. Gordon, Inc.

N. Continuous Corner - Extruded Aluminum; continuous integral fin for surface contact with gypsum board; 7/8-inch (22 mm) wide, tapered to edge; punched with holes staggered to accept screw fastening. Prime with corrosion resistant primer. Provide Pittcon Softforms (Basis of Design) or Schluter:
   1. Subject to compliance with requirements, provide basis of design or comparable by one of the following:
      a. Pittcon Industries.
      b. Fry Reglet Corporation.
      c. Schluter.

O. Joint Treatment - ASTM C475/C475M:
   1. Joint Tape:
      a. Exterior Gypsum Soffit Board: Paper.
      b. Joint Compound for Exterior Applications, Glass Mat Gypsum Sheathing Board: Recommended by sheathing board manufacturer.
      c. Joint Tape, Interior Gypsum Board: Paper.
   2. Joint Compound:
      a. Gypsum Board – Prefilling - At open joints, rounded or beveled panel edges, and damaged surface areas, use setting type taping compound:
         1) Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting type taping compound:
            a) Use setting type compound for installing paper faced metal trim accessories.
         2) Fill Coat: For second coat, use setting type, sandable topping compound.

3) Finish Coat: For third coat, use setting type, sandable topping compound.
4) Skim Coat: For final coat of Level 5 finish, use setting type, sandable topping compound.

b. Cementitious Units: Recommended by backer unit manufacturer.
c. Tile Backing Panels: Recommended by backer unit manufacturer.
d. Water Resistant Gypsum Backing Board: Use setting type taping compound and setting-type, sandable topping compound.
e. Joint Compound, Glass Mat Sheathing Board: Recommended by sheathing board manufacturer.

P. Auxiliary Gypsum Materials - Comply with referenced installation standards and manufacturer's written recommendations:
1. Steel Drill Screws: ASTM C1002, use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112-inch (0.84 to 2.84 mm) thick.
2. Sound Attenuation Blankets - ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool:
a. Fire Resistance Rated Assemblies: Comply with mineral-fiber requirements of assembly.
3. Acoustical Sealant - Nonsag, paintable, nonstaining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90:
a. Manufacturers are subject to compliance with requirements; provide products by one of the following:
1) Hilti, Inc.
2) Pecora Corporation.
3) Specified Technologies, Inc.
4) United States Gypsum Company.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Limitations:
1. Comply with ASTM C840 for gypsum board manufacturer's written instructions, whichever are more stringent:
a. Do not install paper faced gypsum panels until installation areas are enclosed and conditioned.

B. Room Temperatures: Maintain minimum 40 degrees F (4 degrees C). For adhesive attachment and finishing of gypsum board, maintain minimum 50 degrees F (10 degrees C) for 48 hours before application and continuously after until dry. Do not exceed 95 degrees F (35 degrees C) when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

D. Do not install panels that are wet, moisture damaged, and mold damaged:
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.2 EXAMINATION

A. Examine areas and substrates including welded hollow metal frames, cast in anchors, and structural framing, for compliance with requirements and other conditions affecting performance. Proceed with installation after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.4 INSTALLATION

A. Installation Standard: ASTM C754, except comply with framing sizes and spacing indicated.

B. Gypsum Board Assemblies: Comply with requirements in ASTM C840 applicable to framing installation.

C. Suspension System:
1. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement:
   a. Suspend hangers from building structure:
      1) Install hangers plumb and free from contact with insulation or objects within ceiling plenum that are not part of supporting structural or suspension system. Splay hangers where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
      2) Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices:
         a) Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
      3) Do not attach hangers to steel roof deck.
      4) Do not attach hangers to permanent metal forms. Furnish cast in place hanger inserts that extend through forms.
      5) Do not attach hangers to rolled in hanger tabs of composite steel floor deck.
      6) Do not connect or suspend steel framing from ducts, pipes, or conduit.
   b. Fire Resistance Rated Assemblies: Wire tie furring channels to supports.
   c. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

D. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross furring members to each other and butt cut to fit into wall track.

E. Framing Assembly:
1. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall:
   a. Install studs so flanges within framing system point in same direction. Space studs in single layer application as indicated on drawings.
   b. Install tracks (runners) at floors and overhead supports. Extend framing full height

to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling:

1) Door Openings - Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs:
   a) Install two studs at each jamb, unless otherwise indicated.
   b) Install cripple studs at head adjacent to each jamb stud, with minimum 1/2-inch (12.7mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
   c) Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
2) Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

c. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

F. Sound Insulation: Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.

G. Gypsum Panels:

1. Comply with ASTM C840. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged:
   a. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
   b. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
   c. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
   d. Form control and expansion joints with space between edges of adjoining gypsum panels.
   e. Cover both faces of support framing with gypsum panels in concealed spaces, except in chases braced internally:
      1) Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
      2) Fit gypsum panels around ducts, pipes, and conduits.
      3) Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4-inch to 3/8-inch (6.4 mm to 9.5 mm) wide joints to install sealant.
   f. Isolate perimeter of gypsum board applied to nonload bearing partitions at structural abutments, except floors. Provide 1/4-inch to 1/2-inch (6.4mm to 12.7mm) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
   g. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

H. Gypsum Board:

1. Install interior gypsum board where indicated on drawings:
   a. Single Layer Application:
      1) On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
      2) On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire resistance rated assembly, and minimize end joints. Stagger abutting end joints not less than one framing member in alternate courses of panels.
      3) Fastening Methods: Apply gypsum panels to supports with steel drill screws.
2. Multilayer Application:
   a. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
   b. On Z shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
   c. Fastening Methods: Fasten base layers and face layers separately to supports with screws.
3. Wet Areas
   a. In all wet areas need to use Moisture and Mold Resistant Type Gypsum Board.

I. Backing Panels:
1. Cementitious Backer Units: ANSI A108.11; install where indicated with 1/4-inch (6.4 mm) gap where panels abut other construction or penetrations. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

J. Exterior Gypsum Board Soffits:
1. Apply panels perpendicular to supports, with end joints staggered and located over supports:
   a. Install with 1/4-inch (6.4 mm) open space where panels abut other construction or structural penetrations.
   b. Fasten with corrosion-resistant screws.

K. Trim Accessories:
1. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Attach trim according to manufacturer's written instructions:
   a. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.
   b. Exterior Trim:
      1) Install in the following locations:
         a) Cornerbead: Use at outside corners.
         b) LC Bead: Use at exposed panel edges.
   c. Interior Trim:
      1) Install in the following locations:
         a) Cornerbead: Use at outside corners, unless otherwise indicated.
         b) Bullnose Bead: Use at outside corners.
         c) LC Bead: Use at exposed panel edges.
         d) L Bead: Use where indicated or necessary.
         e) U Bead: Use at exposed panel edges.

L. Gypsum Board Finishing:
1. Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces:
   a. Prefill open joints, rounded or beveled edges, and damaged surface areas.
   b. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
   c. Gypsum Board Finish Levels:
      1) Finish panels to levels indicated below and according to ASTM C840:
         a) Level 1: Ceiling plenum areas, concealed areas, and where indicated.
         b) Level 2: Panels that are substrate for tile.
         c) Level 3: Surfaces be coated with drywall primer prior to final finishes. Heavy or medium texture finishes before final painting, or where heavy-grade wall coverings are to be applied as the final decoration. This level of finish is not recommended where smooth painted surfaces, or light to medium weight wall coverings as specified.
         d) Level 4: For surfaces receiving wall covering and flat paints.
         e) Level 5: For surfaces receiving gloss or semigloss paint and surfaces subjected to severe lighting. To be used in Kitchen areas and food service areas only.
   d. Glass Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
   e. Glass Mat Faced Panels: Finish according to manufacturer's written instructions.

M. Installation Tolerances:
1. Suspension System: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.
2. Installation Tolerances, Suspension System: Install suspension systems level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.5 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged:
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 21 16

SECTION 09 23 00 GYPSUM PLASTERING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Gypsum plastering on expanded-metal lath.
2. Gypsum plastering on diagonal wood furring strips.
3. Gypsum plastering on unit masonry.
4. Gypsum plastering on monolithic concrete.

B. Related Sections:
1. Section 03 30 00: Cast-In-Place Concrete.
2. Section 06 10 00: Rough Carpentry.
3. Section 09 21 16: Gypsum Board Assemblies.

1.3 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: Where indicated, provide gypsum plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E119 by a qualified testing agency.

B. Sound-Transmission Characteristics: Where indicated, provide gypsum plaster assemblies identical to those of assemblies tested for STC ratings according to ASTM E90 and classified according to ASTM E413 by a qualified testing agency.

1.4 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

1.5 QUALITY ASSURANCE

A. Mockups:
1. Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution:
   a. Build mockups for each substrate and finish texture indicated for gypsum plastering, including accessories and expansion joints.
   b. Where applicable, provide suitable backing to match existing and flush finish feathering.
   c. Simulate finished lighting conditions for review of mockups.
   d. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   e. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, moisture, direct sunlight, contamination, corrosion, construction traffic, and other causes.

PART 2 PRODUCTS

2.1 EXPANDED-METAL LATH

A. Expanded-Metal Lath - ASTM C847, cold-rolled carbon-steel sheet with ASTM A653/A653M, G60 (Z180), hot-dip galvanized-zinc coating:
   1. Paper Backing: Kraft paper factory bonded to back of lath.
   2. Diamond-Mesh Lath:
      a. Type: Self-furring.
      b. Weight: 2.5 lb/sq. yd. (1.4 kg/sq. m)
   3. Flat-Rib Lath: For contour finishes: Rib depth of not more than 1/8 inch (3 mm), 2.75 lb/sq. yd. (1.5 kg/sq. m).
   4. 3/8-Inch (10-mm) Rib Lath: For studless applications; 3.4 lb/sq. yd. (1.8 kg/sq. m).

2.2 WOOD LATH

A. Where applicable to match existing (Primarily wall construction): Wood lath strips: ¼” X 1 ½” X 4’-0” long of white pine, Spruce, fir, redwood straight-grained woods. Wood lath strips installed diagonally or to match existing. Space ¼” butt joints and 3/8” separations between strips. Use staple or bra sized appropriately. Common nails may be used. Wood lath is not to be used for ceiling applications.

B. Do not apply used lath. When applying Gypsum, pre-wet the wood lath. Lath must be damp when mortar is applied. Best practice is to wet lath the day before depending on outside temperature.

2.3 ACCESSORIES

A. General: Comply with ASTM C841, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required. Where applicable when wood lath is used to match existing provide accessories best suited for the wood lath.

B. Metal Accessories:
   1. Cornerite: Fabricated from expanded-metal lath with ASTM A653/A653M, G60 (Z180), hot-dip galvanized-zinc coating.
   2. Striplath: Fabricated from expanded-metal lath with ASTM A653/A653M, G60 (Z180), hot-dip galvanized-zinc coating.
   3. Cornerbeads - Fabricated from zinc-coated (galvanized) steel:
      a. Smallnose cornerbead with expanded flanges; use unless otherwise indicated.
      b. Smallnose cornerbead with perforated flanges; use on curved corners.
      c. Smallnose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing unit masonry corners.
      d. Bullnose cornerbead, radius 3/4-inch (19-mm) minimum, with expanded flanges; use at locations indicated on Drawings.
   4. Casing Beads: Fabricated from **zinc-coated (galvanized) steel**; square-edged style; with expanded flanges.
   5. Control Joints: Fabricated from **zinc-coated (galvanized) steel**; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.

6. Expansion Joints: Fabricated from **zinc-coated (galvanized) steel**; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
7. Two-Piece Expansion Joints: Fabricated from **zinc-coated (galvanized) steel**; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch (6 to 16 mm) wide; with perforated flanges.

C. Plastic Accessories - Manufactured from high-impact PVC:
1. Cornerbeads - With perforated flanges:
   a. Smallnose cornerbead; use unless otherwise indicated.
   b. Bullnose cornerbead, radius 3/4-inch (19-mm) minimum; use at locations indicated on Drawings.
2. Casing Beads - With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated:
   a. Square-edge style; use unless otherwise indicated.
   b. Bullnose style, radius 3/4-inch (19-mm) minimum; use at locations indicated on Drawings.
3. Control Joints: One-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
4. Expansion Joints: Two-piece type, formed to produce slip-joint and square-edged [1/2-inch- (13-mm-)] [1-inch- (25-mm-)] [1-1/2-inch- (38-mm-)] <Insert dimension> wide reveal; with perforated concealed flanges.

D. Aluminum Trim - Extruded accessories of profiles and dimensions indicated on Drawings:
1. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221, Alloy 6063-T5.
2. Finish: [Mill] [Chemical-conversion coating, ASTM D1730, Type B, compatible with field-applied finish coatings specified] <Insert requirements for anodic or other factory-applied coatings>.

2.4 MISCELLANEOUS MATERIALS

A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Bonding Compound: ASTM C631.

C. Fasteners for Attaching Metal Lath to Substrates: ASTM C841.

D. Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (1.21-mm) diameter unless otherwise indicated.

E. Sound-Attenuation Blankets - ASTM C665, Type I (blankets without membrane facing), produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool:
1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of rated assembly.

F. Mix Additives: Use gypsum plaster accelerators and retarders from plaster manufacturer if required by Project conditions. Use only additives that manufacturer recommends in writing for use with plaster to which it is added.

2.5 BASE-COAT PLASTER MATERIALS

A. Lightweight-Gypsum Ready-Mixed Plaster: ASTM C28/C28M, with mill-mixed perlite

aggregate.

B. Gypsum Neat Plaster: ASTM C28/C28M, for use with job-mixed aggregates.

C. Gypsum Wood-Fibered Plaster: ASTM C28/C28M, for use as is or with the addition of job-mixed sand in up to equal proportions by weight.

D. High-Strength Gypsum Neat Plaster: ASTM C28/C28M, with a minimum, average, dry compressive strength of 2800 psi (19 MPa) according to ASTM C472 for a mix of 100 lb (45 kg) of plaster and 2 cu. ft. (0.06 cu. m) of sand.

E. Aggregates for Base-Coat Plasters: ASTM C35, sand and perlite.

2.6 FINISH-COAT PLASTER MATERIALS

A. Gypsum Gaging Plaster: ASTM C28/C28M.

B. Gypsum Ready-Mixed Finish Plaster: Manufacturer's standard, mill-mixed, gaged, interior finish.

C. High-Strength Gypsum Gaging Plaster: ASTM C28/C28M, with a minimum, average, dry compressive strength of 5000 psi (34 MPa) according to ASTM C472 for a neat mix.

D. Gypsum Keene's Cement: ASTM C61/C61M.

E. Lime: ASTM C 206, Type S, special finishing hydrated lime.

F. Lime: ASTM C 206, Type N, normal finishing hydrated lime.

G. Aggregates for Float Finishes: ASTM C35, sand, graded according to ASTM C842.

2.7 PLASTER MIXES

A. Mixing: Comply with ASTM C842 and manufacturer's written instructions for applications indicated.

B. Mix Additives: Use accelerators and retarders, if required by Project conditions, according to manufacturer's written instructions.

C. Water containing salts, alum, or water containing plaster residue accelerates plaster set and may cause efflorescence. Water containing organic or vegetable matter may retard plaster set, cause staining, and interfere with plaster bond.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Comply with ASTM C842 requirements or gypsum plaster manufacturer's written recommendations, whichever are more stringent.

B. Room Temperatures: Maintain temperatures at not less than 55 deg F (13 deg C) or greater than 80 deg F (27 deg C) for at least seven days before application of gypsum plaster, continuously during application, and for seven days after plaster has set or until plaster has dried.

C. Avoid conditions that result in gypsum plaster drying out too quickly:
   1. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
   2. Maintain relative humidity levels for prevailing ambient temperature that produce normal drying conditions.
   3. Ventilate building spaces in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.

3.2 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

3.4 INSTALLATION, GENERAL

A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.

B. STC-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.

C. Sound-Attenuation Blankets: Where required, install blankets before installing lath unless blankets are readily installed after lath has been installed on one side.

D. Acoustical Sealant: Where required, seal joints between edges of plasterwork and abutting construction with acoustical sealant.

3.5 INSTALLING EXPANDED-METAL LATH

A. Expanded-Metal Lath: Install according to ASTM C841:
   1. Partition Framing and Vertical Furring: Install flat-rib lath.
   2. Flat-Ceiling and Horizontal Framing: Install flat-rib lath.
   3. Curved-Ceiling Framing: Install flat-diamond-mesh lath.
   4. On Solid Surfaces, Not Otherwise Furred: Install self-furring, diamond-mesh lath.

3.6 INSTALLING ACCESSORIES

A. General: Install according to ASTM C841.

B. Cornerbeads: Install at external corners.

C. Casing Beads: Install at terminations of plasterwork, except where plaster passes behind and is concealed by other work and where metal screeds, bases, or frames act as casing beads.

D. Control Joints - Locate as approved by Architect for visual effect, with spacing between joints in either direction not exceeding the following:
   1. Partitions: 20 feet.

E. Aluminum Trim: Install according to manufacturer's written instructions.

3.7 PLASTER APPLICATION

A. General - Comply with ASTM C842:
   1. Do not deviate more than plus or minus 1/8 inch in 10 feet (3 mm in 3 m) from a true plane in finished plaster surfaces when measured by a 10-foot (3-m) straightedge placed on surface.
   2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
   3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Bonding Compound: Apply on **unit masonry and concrete** substrates for direct application of plaster.

C. Base-Coat Plaster:
   1. Over Expanded-Metal Lath:
      a. Scratch Coat: Gypsum neat plaster with job-mixed sand
      b. Brown Coat: Gypsum neat plaster with job-mixed sand
   2. Over Unit Masonry: Gypsum neat plaster with job-mixed sand] <Insert requirements>.
   3. Over Monolithic Concrete: [Gypsum neat plaster with job-mixed sand] <Insert requirements>.

D. Finish Coats:
   1. Smooth-Troweled Finishes:
      a. Materials: [Gypsum gaging plaster and lime putty] [Gypsum ready-mixed finish plaster] [High-strength gypsum gaging plaster and lime putty] [Gypsum Keene's cement and lime putty] <Insert requirements>.
      b. Locations: Provide smooth-troweled finish [unless otherwise indicated] [where indicated] <Insert locations>.
   2. Float Finishes:
      a. Materials: [Gypsum gaging plaster and lime putty] [Gypsum Keene's cement and lime putty] <Insert requirements>.
      b. Locations: Provide float finish [unless otherwise indicated] [where indicated] <Insert locations>.
   3. Sprayed Finishes: [Match Architect's sample] <Insert requirements>.
      a. Materials: [Gypsum ready-mixed finish plaster] <Insert requirements>.
      b. Locations: Provide sprayed finish [unless otherwise indicated] [where indicated] <Insert locations>.
   4. Textured Finishes: [Match Architect's sample] <Insert requirements>.
      a. Materials: [Gypsum ready-mixed finish plaster] <Insert requirements>.
      b. Locations: Provide textured finish [unless otherwise indicated] [where indicated] <Insert locations>.

E. Concealed Plaster:
   1. Where plaster application is concealed behind built-in cabinets, similar furnishings, and equipment, apply finish coat.
   2. Where plaster application is concealed above suspended ceilings and in similar locations, omit finish coat.
   3. Where plaster application is used as a base for adhesive application of tile and similar finishes, omit finish coat.

3.8 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.9 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of other work after plastering is complete. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 09 23 00

SECTION 09 24 00 CEMENT PLASTERING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Exterior plasterwork (stucco).
   2. Metal framing and accessories.
   3. Metal lath and furring.
   4. Accessories necessary for a complete installation.

B. Related Sections:
   1. Section 06 10 00: Rough Carpentry.
   2. Section 07 92 00: Joint Sealants.
   3. Section 09 21 16: Gypsum Board Assemblies.
   4. Section 09 90 00: Painting and Coating.

1.3 SUBMITTALS

A. Product Data: Submit technical data for product and accessory, including construction details and material descriptions.

B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Building Code:
      a. Comply with applicable provisions of the California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA):
         1) CBC, 2507.3 Attachment requirements.
   2. Fire Resistance Ratings: Where indicated, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E119 by a qualified testing agency.

B. Pre-installation Conference: Conduct conference at site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver cementitious materials in original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number.

B. Store materials inside under cover and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers are subject to compliance with requirements; provide products of one of the following:
   1. Metal Lath and Accessories:
      a. Alabama Metal Industries.
      b. CEMCO.
      c. ClarkDietrich Building Systems.
      d. Marino/WARE.
      e. Phillips Manufacturing.
   2. Wire Fabric Lath:
      a. Davis Wire.
      b. Jaenson Wire Company.
      c. Keystone Steel and Wire Co.
      d. K-Lath.
   3. Plastic Accessories:
      a. Alabama Metal Industries.
      b. Phillips manufacturing.
      c. Plastic Components.
      d. Vinyl Corp.
   4. Ready Mixed Finish Coat Plaster:
      a. Omega Products International.
      b. California Stucco Product.
      c. El Rey Solutions.
      d. Florida Stucco.
      e. Quikrete.
      f. Shamrock Stucco.
   5. Acrylic Based Finish Coat:
      a. California Stucco Product.
      b. Dryvit Systems.
      c. El Rey Solutions.
      d. Finestone, BASF Corp.
      e. Omega Products International.
      f. Senergy, BASF Corp.
      g. Sto Corp.

B. Cold Formed Steel Framing: Refer to 09 21 16 for Gypsum Board Assemblies framing for exterior plaster.

C. Steel Studs and Runners: Refer to Section 09 21 16 for steel partition framing for interior plaster.

D. Soffit Framing: Refer to Sections 06 10 00 and 09 21 16.

E. Metal Lath:
   1. Expanded Metal Lath:
      a. ASTM C847, cold rolled carbon steel sheet with ASTM A653/A653M, G60 (Z180), hot dip galvanized zinc coating:
         1) Diamond Mesh Lath: Self furring, 3.4 lb/sq. yd. (1.8 kg/sq. m).
         2) Comply with DSA IR 25-4 for the installation of Self-Furring Metal Lath.
   2. Paper Backing:
      a. FS UU-B-790a, Type I, Grade D, Style 1a vapor retardant paper:
         1) Provide paper backed lath at exterior locations.
   3. Building Wrap:
      a. Spun-bounded high density polyethylene fibers. No binders or fillers. As manufactured by: Dupont Tyvek Commercial Type D Building Wrap or approved

equal. Install per manufacturer's instructions (Installation to meet CBC 2510.6).

F. Accessories:
1. Comply with ASTM C1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required:
a. Metal Accessories:
1) Foundation Weep Screed: Fabricated from hot dip galvanized steel sheet, ASTM A653/A653M, G60 (Z180) zinc coating.
2) Cornerite: Fabricated from metal lath with ASTM A653/A653M, G60 (Z180), hot dip galvanized-zinc coating.
3) Outside Corner Reinforcement: Fabricated from metal lath with ASTM A653/A653M, G60 (Z180), hot dip galvanized zinc coating.
4) Cornerbeads - Fabricated from zinc or zinc coated (galvanized) steel:
a) Smallnose cornerbead with expanded flanges; use unless otherwise indicated.
b) Smallnose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing unit masonry corners.
5) Casing Beads: Fabricated from zinc or zinc coated (galvanized) steel; square edged style; with expanded flanges.
6) Control Joints: Fabricated from zinc or zinc coated (galvanized) steel; one piece type, folded pair of unperforated screeds in M shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
7) Expansion Joints: Fabricated from zinc or zinc coated (galvanized) steel; folded pair of unperforated screeds in M shaped configuration; with expanded flanges.
8) Two Piece Expansion Joints: Fabricated from zinc or zinc coated (galvanized) steel; formed to produce slip joint and square edged reveal adjustable from 1/4 to 5/8-inch (6 to 16 mm) wide; with perforated flanges.
b. Plastic Accessories - Manufactured from high impact PVC:
1) Cornerbeads - With perforated flanges:
a) Smallnose cornerbead; use unless otherwise indicated.
b) Bullnose cornerbead, radius 3/4 inch (19 mm) minimum; use at locations indicated on Drawings.
2) Casing Beads - With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated:
a) Square edge style, unless otherwise indicated.
b) Bullnose style, radius 3/4 inch (19 mm) minimum; use at locations indicated on Drawings.
3) Control Joints: One piece type, folded pair of unperforated screeds in M shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
4) Expansion Joints: Two piece type, formed to produce slip joint and square edged 1/2 inch (13 mm) wide reveal; with perforated concealed flanges.
c. Aluminum Reveals and Moldings, where applicable:
1) Manufacturer: Fry Reglet
2) Width: 2 inch
3) Material: Extruded 6063 T5 Aluminum
4) Finish: Kynar - Silver Satin.
5) Provide all required accessories, moldings, and prefabricated intersection/corner transition pieces for a complete installation.
d. Aluminum Soffit Vents:
1) Manufacturer: Fry Reglet
2) Width: 3 inch
3) Material: Extruded 6063 T5 Aluminum
4) Finish: Kynar - Silver Satin

5) Provide all required accessories, moldings, and prefabricated intersection/corner transition pieces for a complete installation.

G. Miscellaneous Materials:
1. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
2. Fiber for Base Coat: Alkaline resistant glass or polypropylene fibers, 1/2-inch (13 mm) long, free of contaminants, manufactured for use in cement plaster.
3. Bonding Compound: ASTM C932.
4. Fasteners for Attaching Metal Lath to Substrates: ASTM C1063.
5. Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (1.21 mm) diameter unless otherwise indicated.
6. Building Wrap: Spun-bounded high density polyethylene fibers. No binders or fillers. As manufactured by: Dupont Tyvek Commercial Type D Building Wrap or approved equal. Install per manufacturer's instructions.
7. Sound Attenuation Blankets:
   a. ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool:
      1) Fire Resistance Rated Assemblies: Comply with mineral-fiber requirements of assembly.

H. Plaster Materials:
1. Portland Cement - ASTM C150/C150M, Type I or II:
   a. Color for Finish Coats: Match existing.
2. Colorants for Job Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color selected by Architect.
3. Lime: ASTM C206, Type S; or ASTM C207, Type S.
4. Sand Aggregate - ASTM C897:
   a. Color for Job Mixed Finish Coats: White.
5. Exposed Aggregates for Finish Coats: Match existing.
6. Ready Mixed Finish Coat Plaster:
   a. Mill mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
      1) Color: Selected by Architect.
7. Acrylic Based Finish Coatings:
   a. Factory mixed acrylic emulsion coating systems formulated with colorfast mineral pigments and fine aggregates; for use over cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic based finishes:
      1) Color: Selected by Architect.

2.2 PLASTER MIXES

A. Comply with ASTM C926 for applications indicated:
1. Fiber Content: Add fiber to base coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. (0.6 kg of fiber/cu. m) of cementitious materials.

B. Base Coat Mixes for Use over Metal Lath:
1. Scratch and brown coats for three coat plasterwork:
   a. Portland Cement Mix:
      1) Scratch Coat: For cementitious material, mix 1-part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

2) Brown Coat: For cementitious material, mix 1-part portland cement and 3/4 to 1-1/2 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

C. Job Mixed Finish Coat Mixes:
1. Portland Cement Mix: For cementitious materials, mix 1-part portland cement and 3/4 to 1-1/2 parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.

D. Factory Prepared Finish Coat Mixes: For ready mixed finish coat plasters or acrylic based finish coatings, comply with manufacturer's written instructions.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Comply with applicable requirements of ASTM C926.

B. Environmental Requirements: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after plaster application.

C. Cold Weather Requirements: Provide heat and protection, temporary or permanent, as required to protect each coat of plaster from freezing for at least 24 hours after application. Distribute heat uniformly to prevent concentration of heat on plaster near heat sources; provide deflection or protective screens.

D. Warm Weather Requirements: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic and job conditions to prevent dry out during cure period. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.

E. Ventilation: Provide natural or mechanical means of ventilation to properly dry interior spaces after portland cement plaster has cured.

F. Exterior Plasterwork:
1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
2. Apply plaster when ambient temperature is greater than 40 degrees F (4.4 degrees C).
3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

G. Protect contiguous Work from soiling and moisture deterioration caused by plastering. Provide temporary covering and take precautions necessary to minimize spattering of plaster on adjacent Work.

H. Factory Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

3.2 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Proceed with installation after correcting unsatisfactory conditions.

3.3 PREPARATION

A. Protect adjacent Work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

B. Prepare smooth, solid substrates for plaster according to ASTM C926.

3.4 INSTALLATION

A. Metal Lath:
   1. Install according to ASTM C1063:
      a. Partition Framing and Vertical Furring: Flat diamond mesh lath.
      b. Horizontal Framing: Flat diamond mesh lath.

B. Accessories:
   1. Install according to ASTM C1063 and at locations indicated on Drawings:
      a. Reinforcement for External (Outside) Corners:
         1) Install lath type, cornerbead at exterior locations.
         2) Install cornerbead at interior locations.
      b. Control Joints - Locate as approved by Architect for visual effect:
         1) As required to delineate plasterwork into areas (panels) of the following maximum sizes:
            a) Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
            b) Horizontal and Other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
         2) At distances between control joints of not greater than 18 feet (5.5 m) o.c.
         3) As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
         4) Where control joints occur in surface of construction directly behind plaster.
         5) Where plasterwork areas change dimensions, to delineate rectangular shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.5 PLASTER APPLICATION

A. Comply with ASTM C926:
   1. Do not deviate more than plus or minus 1/4 inch in 10 feet (6 mm in 3 m) from a true plane in finished plaster surfaces when measured by a 10-foot (3-m) straightedge placed on surface.
   2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
   3. Provide plaster surfaces ready to receive field applied finishes indicated.

B. Flat Surface Tolerances: Do not deviate more than plus or minus 1/8 inch in 10 feet (3 mm in 3 m) from a true plane in finished plaster surfaces, measured by a 10 foot (3m) straightedge placed at any location on surface.

C. Walls; Base Coat Mixes for Use over Metal Lath:
   1. For scratch and brown coats, for three coat plasterwork with 3/4 inch (19 mm) total thickness:
      a. Portland cement mixes.

D. Plaster Finish Coats: Apply to provide dash finish.

E. Acrylic Based Finish Coatings (Contractor Option to Plaster Finish Coat): Apply coating system, including primers, finish coats, and sealing topcoats, according to manufacturer's written instructions.

F. Concealed Exterior Plasterwork: Where plaster application is used as a base for adhered finishes, omit finish coat.

3.6 PLASTER REPAIRS

A. Repair or replace Work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

B. Cut, patch, replace, repair, and point up plaster as necessary to accommodate other Work. Repair cracks and indented surfaces. Point up finish plaster surfaces around items that are built into or penetrate plaster surfaces. Repair or replace Work to eliminate blisters, buckles, check cracking, dry outs, efflorescence, excessive pinholes, and similar defects. Repair or replace work as necessary to comply with required visual effects.

3.7 TOLERANCES

A. Maximum Variation from True Lines and Levels: 1/8 inch in 10 feet (3mm in 3 m).

B. Maximum Variation from True Position: 1/8 inch (3mm).

3.8 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of Work after plastering is complete. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

B. Remove unused materials, containers, equipment, and plaster debris.

C. Protect plaster and maintain conditions ensuring finished plaster is without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 24 00

SECTION 09 24 10 CEMENT PLASTERING (PATCH AND REPAIR)

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes: Requirements including but not limited to:
   1. Exterior cement plaster repair.
   2. Metal lath and furring.
   3. Accessories necessary for a complete installation.

B. Related documents:
   1. Section 02 41 19: Selective Demolition.
   2. Section 06 10 00: Rough Carpentry.
   3. Section 09 90 00: Painting and Coatings.

1.3 SUBMITTALS

A. Product Data: Submit technical data for product and accessory, including construction details and material descriptions.

B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Building Code: Comply with applicable provisions of the California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA).
   2. Fire Resistance Ratings: Where indicated, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E 119 by a qualified testing agency.

B. Preinstallation Conference: Conduct conference at site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver cementitious materials in original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number.

B. Store materials inside under cover, and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.6 PROJECT CONDITIONS

A. Comply with applicable requirements of ASTM C 926.

B. Environmental Requirements: Comply with requirements of referenced plaster application

standards and recommendations of plaster manufacturer for environmental conditions before, during, and after plaster application.

C. Cold Weather Requirements: Provide heat and protection, temporary or permanent, as required to protect each coat of plaster from freezing for at least 24 hours after application. Distribute heat uniformly to prevent concentration of heat on plaster near heat sources; provide deflection or protective screens.

D. Warm Weather Requirements: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic and job conditions to prevent dry out during cure period. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.

E. Exterior Plasterwork:
1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
2. Apply plaster when ambient temperature is greater than 40 degrees F (4.4 degrees C).
3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

F. Protect contiguous work from soiling and moisture deterioration caused by plastering. Provide temporary covering and take precautions necessary to minimize spattering of plaster on adjacent work.

G. Factory Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
1. Metal Lath and Accessories:
   a. Alabama Metal Industries (AMICO).
   b. CEMCO.
   c. ClarkDietrich Building Systems.
   d. Marino/WARE.
   e. Phillips Manufacturing.
2. Plastic Accessories:
   a. Alabama Metal Industries (AMICO).
   b. Phillips manufacturing.
   c. Plastic Components.
   d. Vinyl Corp.
3. Ready Mixed Finish Coat Plaster:
   a. California Stucco Product.
   b. El Rey Solutions.
   c. Omega Products International.
   d. Quikrete.
   e. Shamrock Stucco.

4. Acrylic Based Finish Coat:
   a. California Stucco Product.

b. Dryvit Systems.
c. El Rey Solutions.
d. Finestone, BASF Corp.
e. LaHabra, a brand of Parex USA, Inc.
f. Omega Products International.
g. Senergy, BASF Corp.
h. Sto Corp.

B. Metal Lath:
1. Expanded Metal Lath: ASTM C 847, cold rolled carbon steel sheet with ASTM A 653/A 653M, G60 (Z180), hot dip galvanized zinc coating.
a. Diamond Mesh Lath: Self furring, 3.4 lb/sq. yd. (1.8 kg/sq. m).
b. Comply with DSA IR 25-4 for the installation of Self-Furring Metal Lath.

C. Accessories: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
1. Metal Accessories:
a. Foundation Weep Screed: Fabricated from hot dip galvanized steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.
b. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot dip galvanized-zinc coating.
c. Outside Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot dip galvanized zinc coating.
d. Cornerbeads: Fabricated from zinc or zinc coated (galvanized) steel.
1) Smallnose cornerbead with expanded flanges; use unless otherwise indicated.
2) Smallnose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing unit masonry corners.
e. Casing Beads: Fabricated from zinc or zinc coated (galvanized) steel; square edged style; with expanded flanges.
f. Control Joints: Fabricated from zinc or zinc coated (galvanized) steel; one piece type, folded pair of unperforated screeds in M shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
g. Expansion Joints: Fabricated from zinc or zinc coated (galvanized) steel; folded pair of unperforated screeds in M shaped configuration; with expanded flanges.
h. Two Piece Expansion Joints: Fabricated from zinc or zinc coated (galvanized) steel; formed to produce slip joint and square edged reveal adjustable from 1/4 to 5/8 inch (6 to 16 mm) wide; with perforated flanges.
2. Plastic Accessories: Manufactured from high impact PVC.
a. Cornerbeads: With perforated flanges.
1) Smallnose cornerbead; use unless otherwise indicated.
2) Bullnose cornerbead, radius 3/4 inch (19 mm) minimum; use at locations indicated on Drawings.
b. Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.
1) Square edge style; use unless otherwise indicated.
2) Bullnose style, radius 3/4 inch (19 mm) minimum; use at locations indicated on Drawings.
c. Control Joints: One piece type, folded pair of unperforated screeds in M shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
d. Expansion Joints: Two piece type, formed to produce slip joint and square edged 1 inch (25 mm) wide reveal; with perforated concealed flanges.

3. Aluminum Reveals and Moldings: Where applicable.
a. Manufacturer: Fry Reglet

b. Width: 2 inch
c. Material: Extruded 6063 T5 Aluminum
d. Finish: Kynar - Silver Satin.
e. Provide all required accessories, moldings, and prefabricated intersection/corner transition pieces for a complete installation.

4. Aluminum Soffit Vents: Where applicable.
   a. Manufacturer: Fry Reglet
   b. Width: 3 inch
   c. Material: Extruded 6063 T5 Aluminum
   d. Finish: Kynar - Silver Satin
   e. Provide all required accessories, moldings, and prefabricated intersection/corner transition pieces for a complete installation.

D. Miscellaneous Materials:
   1. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
   2. Fiber for Base Coat: Alkaline resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in cement plaster.
   3. Bonding Compound: ASTM C 932.
   4. Fasteners for Attaching Metal Lath to Substrates: ASTM C 1063.
   5. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475 inch 1.21 mm diameter unless otherwise indicated.
   6. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
      a. Fire Resistance Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Plaster Materials:
   1. Portland Cement: ASTM C 150/C 150M, Type II.
      a. Color for Finish Coats: Integral color plaster shall match exterior paint color as indicated, provide sample/mock-up for approval by Architect.
   2. Colorants for Job Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color selected by Architect.
   3. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.
   4. Sand Aggregate: ASTM C 897.
      a. Color for Job Mixed Finish Coats: White**.**
   5. Exposed Aggregates for Finish Coats: Match existing.
   6. Ready Mixed Finish Coat Plaster: Mill mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
      a. Color: Integral color plaster shall match exterior paint color as indicated, provide sample/mock-up for approval by Architect.
   7. Acrylic Based Finish Coatings: Factory mixed acrylic emulsion coating systems formulated with colorfast mineral pigments and fine aggregates; for use over cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic based finishes.
      a. Color: Integral color plaster shall match exterior paint color as indicated, provide sample/mock-up for approval by Architect.

2.2 PLASTER MIXES

A. Comply with ASTM C 926 for applications indicated.
   1. Fiber Content: Add fiber to base coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. (0.6 kg of fiber/cu. m) of cementitious materials.

B. Base Coat Mixes for Use over Metal Lath: Scratch and brown coats for three coat plasterwork:
   1. Portland Cement Mix:
      a. Scratch Coat: For cementitious material, mix 1 part portland cement and **3/4 to 1-1/2** parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
      b. Brown Coat: For cementitious material, mix 1 part portland cement and **3/4 to 1-1/2** parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

C. Job Mixed Finish Coat Mixes:
   1. Portland Cement Mix: For cementitious materials, mix 1 part portland cement and **3/4 to 1-1/2** parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.

D. Factory Prepared Finish Coat Mixes: For ready mixed finish coat plasters or acrylic based finish coatings, comply with manufacturer's written instructions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the work. Proceed with installation after correcting unsatisfactory conditions.

3.2 PREPARATION

A. Remove plaster to nearest joint where possible. Saw cut joint for patch at location agreed upon with Architect prior to work.

B. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

C. Prepare smooth, solid substrates for plaster according to ASTM C 926.

3.3 INSTALLATION

A. Metal Lath: Install according to ASTM C 1063.
   1. Partition Framing and Vertical Furring: Flat diamond mesh lath.
   2. Horizontal Framing: Flat diamond mesh lath.

B. Accessories: Install according to ASTM C 1063 and at locations indicated on Drawings.
   1. Reinforcement for External (Outside) Corners:
      a. Install cornerbead at exterior corner locations.
      b. Install cornerbead at interior corner locations.
   2. Control Joints: Locate as approved by Architect for visual effect where not illustrated on drawings.
      a. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
         1) Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
         2) Horizontal and Other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
      b. At distances between control joints of not greater than 12 feet o.c.
      c. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
      d. Where control joints occur in surface of construction directly behind plaster.
      e. Where plasterwork areas change dimensions, to delineate rectangular shaped

areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

f. Where plasterwork repair involves any of the above referenced conditions.

3.4 PLASTER APPLICATION

A. Comply with ASTM C 926.
   1. Do not deviate more than plus or minus 1/4 inch in 10 feet (6 mm in 3 m) from a true plane in finished plaster surfaces when measured by a 10-foot (3-m) straightedge placed on surface.
   2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
   3. Provide plaster surfaces ready to receive field applied finishes indicated.

B. Flat Surface Tolerances: Do not deviate more than plus or minus 1/8 inch in 10 feet (3 mm in 3 m) from a true plane in finished plaster surfaces, measured by a 10 foot (3m) straightedge placed at any location on surface.

C. Walls; Base Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three coat plasterworks with 3/4 inch (19 mm) total thickness:
   1. Portland cement mixes.

D. Plaster Finish Coats: Apply to provide dash finish.

E. Acrylic Based Finish Coatings (Contractor Option to Plaster Finish Coat): Apply coating system, including primers, finish coats, and sealing topcoats, according to manufacturer's written instructions.

F. Concealed Exterior Plasterwork: Where plaster application is used as a base for adhered finishes, omit finish coat.

3.5 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

B. Cut, patch, replace, repair, and point up plaster as necessary to accommodate other work. Repair cracks and indented surfaces. Point up finish plaster surfaces around items that are built into or penetrate plaster surfaces. Repair or replace work to eliminate blisters, buckles, check cracking, dry outs, efflorescence, excessive pinholes, and similar defects. Repair or replace work as necessary to comply with required visual effects.

3.6 TOLERANCES

A. Maximum Variation from True Lines and Levels: 1/8 inch in 10 feet (3mm in 3 m).

B. Maximum Variation from True Position: 1/8 inch (3mm).

3.7 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of work after plastering is complete. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be

plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

B. Remove unused materials, containers, equipment, and plaster debris.

C. Protect plaster and maintain conditions ensuring finished plaster is without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 24 00

SECTION 09 29 00 GYPSUM BOARD

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes requirements including but not limited to:
1. Paper faced gypsum board.
2. Mold, mildew, moisture resistant paper faced gypsum board.
3. Fiberglass mat faced gypsum board.
4. Cement board.
5. Texture finishes.
6. Accessories.
7. Trim.
8. Joint tape.
9. Joint compounds.

B. Related Sections:
1. Section 06 10 00: Rough Carpentry.
2. Section 08 11 13: Hollow Metal Doors and Frames.
3. Section 08 31 13: Access Doors and Frames.
4. Section 08 51 13: Aluminum Windows.
5. Section 09 90 00: Painting and Coating.

1.3 REFERENCES

A. American National Standards Institute (ANSI):
1. ANSI A108 Interior Installation of Cementitious Backer Units.

B. ASTM International (ASTM):
1. ASTM C475/C475M Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
2. ASTM C840 Standard Specification for Application and Finishing of Gypsum Board.
3. ASTM C919 Standard Practice for Use of Sealants in Acoustical Applications.
4. ASTM C1002 Standard Specifications for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
5. ASTM C1178/C1178M Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
6. ASTM C1325 Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units.
7. ASTM C1396/C1396M Standard Specification for Gypsum Board.
8. ASTM C1629/C1629M Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
9. ASTM C1658/C1658M Standard Specification for Glass Mat Gypsum Panels.
10. ASTM C1766 Standard Specification for Factory-Laminated Gypsum Panel.
11. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
12. ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

13. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

C. Gypsum Association (GA):
1. GA-214 Recommended Levels of Gypsum Board Finish.
2. GA-216 Application and Finishing of Gypsum Panel Products.

1.4 SUBMITTALS

A. Product Data: Submit for each type of drywall including calculations for loadings and stresses of exterior walls and specially fabricated framing based on manufacturer's load tables.
1. Gypsum Board.
2. Foil Backed Gypsum
3. Cementitious Board.
4. Texture finishes.
5. Trim accessories.
6. Samples
7. Textured Finishes: Apply to gypsum board, 4 by 6 inches.
8. Trim Accessories: 12-inch length of trim.

B. Shop Drawings: Indicate locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other units of Work.

C. Samples:
1. Trim Accessories: Full size Sample in 12 inch (300 mm) long length for each trim accessory indicated.
2. Textured Finishes: 12 inches by 12 inches (300 mm by 300 mm) for each textured finish indicated and on same backing indicated for Work.

D. Calculations: Submit calculations verifying steel partition stud minimum base metal thickness and depth compliance with Code and ASTM C645 for height, load, and deflection.

E. Evaluation Reports: ICC-ES reports for dimpled steel studs and runners and firestop tracks.

F. Sustainable Design Submittals.
1. Sustainable Design closeout Requirements.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
1. 2022 California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA):
   a. CBC-7 – Chapter 7, Fire Resistant Materials and Construction
   b. CBC-19A – Chapter 19A, Concrete
   c. CBC – Chapter 25, Gypsum Board and Plaster.
2. Division of the State Architect, Interpretation of Regulations (DSA-IR):
   a. DSA-IR 25-3, Drywall Ceiling Suspension Conventional Construction-One Layer.
   b. DSA-IR 25-2.13, Metal Suspension Systems for Lay in Panel Ceilings.
3. Fire Resistance Rated Assemblies: For fire resistance rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. Single Source Responsibility:

1. Framing Members: Obtain steel framing members from single manufacturer.
2. Panel Products: Obtain each type of gypsum board and other panel products from single manufacturer.
3. Finishing Materials: To the extent possible, obtain finishing materials from same manufacturer supplying gypsum board products. When not possible, obtain materials from manufacturer acceptable to gypsum board manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

PART 2 PRODUCTS

2.1 MATERIALS

A. Basis of Design: Products from **National Gypsum Company**, 2001 Rexford road, Charlotte, North Carolina 2811. 704-365-7300 ng@nationalgypsum.com.
   1. All other manufacturers are subject to compliance with requirements to match or exceed products listed here-in.

2.2 PAPER FACED GYPSUM BOARD

A. Gypsum Board, Regular Core, ASTM C1396/C1396M:
   1. Gold Bond® Gypsum Board.
   2. Gold Bond® High Strength LITE® Gypsum Board.
   3. Gold Bond® High Flex® Gypsum Board.
      a. Thickness: [1/4 inch][3/8 inch][1/2 inch].
      b. Core: Regular.
      c. Edges: [Tapered][Square].

B. Gypsum Board, Fire-Resistant Core: ASTM C1396/C1396M.
   1. Gold Bond® Fire-Shield C™ 1/2" Gypsum Board.
   2. Gold Bond® Fire-Shield C™ 5/8" Gypsum Board.
      a. Thickness:[1/2 inch][5/8 inch][3/4 inch].
      b. Core: [Type C][Type X][Ultra-Shield].
      c. Edges: [Tapered][Square].

C. Gypsum Board, Fire-Resistant Core, Foil Backed: ASTM C1396/C1396M.
   1. Gold Bond® High Strength Fire-Shield 30® Gypsum Board.
   2. Gold Bond® High Strength Fire-Shield 60® Gypsum Board.
   3. Gold Bond® Ultra-Shield FS® 3/4" Gypsum Board.
   4. Gold Bond® Foil Back Gypsum Board.
      a. Thickness: [1/2 inch][5/8 inch].
      b. Core: [Regular][Type X].
      c. Edges: [Tapered][Square].

D. Gypsum Board, Fire-Resistant Core, Prefinished: ASTM C1396/C1396M.
   1. Gold Bond® Durasan® Prefinished Gypsum Board.
      a. Thickness: [1/2 inch][5/8 inch].
      b. Core: [Regular][Type X].

c. Edges: Beveled.
d. Vinyl Face: where applicable, refer to Finish Drawings.

2.3 MOLD, MILDEW, MOISTURE RESISTANT PAPER FACED GYPSUM BOARD

A. Gypsum Board, Regular Core, Mold, Mildew, Moisture Resistant: ASTM C1396/C1396M.
1. Gold Bond® XP® Gypsum Board.
a. Thickness: 1/2 inch.
b. Core: Regular.
c. Edges: [Tapered][Square].
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.
e. Mold/Mildew Resistance: ASTM G21, Score of 0.

B. Gypsum Board, Fire Resistant Core, Mold, Mildew Moisture Resistant: ASTM C1396/C1396M.
1. Gold Bond® XP® Fire-Shield® Gypsum Board.
2. Gold Bond® XP® Fire-Shield® 5/16" Gypsum Board.
3. Gold Bond® XP® Fire-Shield C™ 1/2" Gypsum Board.
4. Gold Bond® XP® Fire-Shield C™ 5/8" Gypsum Board.
5. Gold Bond® XP® Ultra-Shield FS® 3/4" Gypsum Board.
6. Gold Bond® Shaftliner XP®.
a. Thickness: [5/16 inch][1/2 inch][5/8 inch][3/4 inch][1 inch].
b. Core: [Regular][Type X][Type C][Ultra-Shield].
c. Edges: [Tapered][Square][Double beveled].
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.
e. Mold/Mildew Resistance: ASTM G21, Score of 0.

C. Gypsum Board, Mold, Mildew, Moisture, and Abuse Resistant: ASTM C1396/C1396M.
1. Gold Bond® XP® Hi-Abuse® Gypsum Board.
a. Thickness: 5/8 inch.
b. Core: Type X.
c. Edges: Tapered.
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.
e. Surface Abrasion: ASTM C1629/C1629M; Level 3.
f. Indentation: ASTM C1629/C1629M; Level 1.
g. Soft-Body Impact: ASTM C1629/C1629M; Level 2.
h. Hard-Body Impact: ASTM C1629/C1629M; Level 1.

D. Gypsum Board, Mold, Mildew, Moisture, and Impact Resistant: ASTM C1396/C1396M.
1. Gold Bond® XP® Hi-Impact® Gypsum Board.
a. Thickness: 5/8 inch.
b. Core: Type X.
c. Edges: Tapered.
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.
e. Surface Abrasion: ASTM C1629/C1629M; Level 3.
f. Indentation: ASTM C1629/C1629M; Level 1.
g. Soft-Body Impact: ASTM C1629/C1629M; Level 3.
h. Hard-Body Impact: ASTM C1629/C1629M; Level 3.

E. Gypsum Board, Mold, Mildew, Moisture Resistant, with Sound Dampening: ASTM C1396/C1396M and ASTM C1766.
1. Gold Bond® SoundBreak XP Wall® Board.
2. Gold Bond® SoundBreak XP Ceiling® Board.
3. Gold Bond® SoundBreak XP Retrofit® Board.
a. Thickness: [5/16 inch][5/8 inch][3/4 inch].
b. Core: [Regular][Type X].

c. Edges: Tapered.
d. Surface Abrasion: ASTM C1629/C1629M; Level 3.
e. Mold/Mildew Resistance: ASTM D3273; Score of 10.
f. Mold/Mildew Resistance: ASTM G21, Score of 0.

2.4 FIBERGLASS MAT FACED GYPSUM BOARD

A. Gypsum Board: ASTM C1658/C1658M.
1. Gold Bond® eXP® Interior Extreme® Gypsum Panel.
a. Thickness: 1/2 inch.
b. Core: Regular.
c. Edges: Tapered.
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.

B. Gypsum Board, Fire Resistant Rated: ASTM C1658/C1658M.
1. Gold Bond® eXP® Interior Extreme® Type C™ 1/2" Gypsum Panel.
2. Gold Bond® eXP® Interior Extreme® Type C™ 5/8" Gypsum Panel.
3. Gold Bond® eXP® Shaftliner.
a. Thickness: [1/2 inch][5/8 inch][1 inch].
b. Core: [Type X][Type C].
c. Edges: [Tapered][Double beveled].
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.

C. Gypsum Board, Abuse Resistant: ASTM C1658/C1658M.
1. Gold Bond® eXP® Interior Extreme® AR Gypsum Panel.
a. Thickness: 5/8 inch.
b. Core: Type X.
c. Edges: Tapered.
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.
e. Surface Abrasion: ASTM C1629/C1629M; Level 3.
f. Indentation: ASTM C1629/C1629M; Level 1.
g. Soft-Body Impact: ASTM C1629/C1629M; Level 2.
h. Hard-Body Impact: ASTM C1629/C1629M; Level 1.

D. Gypsum Board, Impact Resistant: ASTM C1658/C1658M.
1. Gold Bond® eXP® Interior Extreme® IR Gypsum Panel.
a. Thickness: 5/8 inch.
b. Core: Type X.
c. Edges: Tapered.
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.
e. Surface Abrasion: ASTM C1629/C1629M; Level 3.
f. Indentation: ASTM C1629/C1629M; Level 1.
g. Soft-Body Impact: ASTM C1629/C1629M; Level 3.
h. Hard-Body Impact: ASTM C1629/C1629M; Level 2.

E. Gypsum Board, Tile Backer: ASTM C1178/C1178M.
1. Gold Bond® eXP® Tile Backer.
2. Gold Bond® eXP® Fire-Shield® Tile Backer.
a. Thickness: [1/2 inch][5/8 inch].
b. Core: [Regular][Type X].
c. Edges: Square.
d. Mold/Mildew Resistance: ASTM D3273; Score of 10.

2.5 CEMENT BOARD

A. Cement Board, Backer, Interior/Exterior: ASTM C1325.

1. PermaBASE® Cement Board.
2. PermaBASE PLUS® Cement Board.
   a. Thickness: [1/2 inch][5/8 inch].
   b. Weight: [2,5 lbs./sq.ft.][2.9 lbs./sq.ft.][3.65 lbs./sq.ft.].
   c. Edges: Round.
   d. Mold/Mildew Resistance: ASTM D3273; Score of 10.
   e. Shear Bond Strength: 241 psi.

B. Cement Board, Interior Underlayment: ASTM C1325.
1. PermaBASE UltraBacker® Cement Board.
   a. Thickness: 1/4 inch.
   b. Weight: 1.8 lbs./sq.ft.
   c. Edges: Round.
   d. Mold/Mildew Resistance: ASTM D3273; Score of 10.

2.6 TEXTURE FINISHES

A. Primer: Manufacturer recommended for surface being coated.

B. Non-Aggregated Wall and Ceiling Texture:
1. ProForm™ Wall and Ceiling Spray.
2. ProForm™ Perfect Spray® EM.
   a. Texture: [Spray spatter][Spatter knockdown][Orange peel].

C. Polystyrene Aggregate Ceiling Texture:
1. ProForm™ Perfect Spray® Medium.
   a. Texture: [Fine][Medium][Coarse].

2.7 ACCESSORIES

A. Acoustical Sealant: ASTM C919.
1. Manufacturers and Products:
   b. Grabber Construction Products; Acoustical Sound and Smoke Sealant GSCSF.
   a. Specified Technologies Inc.; SpecSeal SNS Smoke N Sound Acoustical Sealant.
   b. BOSS Products; BOSS 826 Acoustical Acrylic Sound Sealant.

B. Firestopping: ASTM E814.
1. Manufacturers and Products:
   a. Specified Technologies Inc.; SpecSeal SSP Putty & Putty Pads.
   b. BOSS Products; BOSS 818 Fire Rated Putty Pads.

C. Fasteners for Cement Board: ASTM C1002.
1. PermaBASE™ Cement Board Screws Hi-Lo.
   a. Wafer head, corrosion-resistant.
   b. Thickness, overall: [1-1/4 inch][2 inch][2-1/2 inch].
2. PermaBASE™ Cement Board Screws Drill Point.
   a. Wafer head, corrosion-resistant.
   b. Thickness, overall: [1-1/4 inch][2 inch][2-1/2 inch].

D. Fasteners for Tile Backer: ASTM C1002.
1. Fasteners for 1/2 inch thick panels:
   a. Wood Framing: [1-1/4 inch minimum galvanized roofing nail][1-1/4 inch minimum corrosion resistant course thread bugle head].
   b. Metal Framing: 1 inch minimum corrosion resistant sharp point or drill point bugle head screw.

E. Fasteners for 5/8 inch thick panels:
1. Wood Framing: [1-3/4 inch minimum galvanized roofing nail][1-1/4 inch minimum corrosion resistant course thread bugle head][As required by fire-rated assembly].
2. Metal Framing: [1-1/4 inch minimum corrosion resistant sharp point or drill point bugle head screw][As required by fire-rated assembly].

2.8 TRIM

A. Vinyl Trim:
1. One-Piece: Extruded vinyl form; vinyl coating matching boards.(1/2 inch Board)
2. Two-Piece: Extruded vinyl form; vinyl coating matching boards.(5/8 inch Board)

2.9 JOINT TAPE

A. Paper Tape: 2-1/16 inch wide, cross-fibered paper, ASTM C475/C475M.
1. ProForm™ Paper Joint Tape.

B. Fiberglass Mesh Tape: Polymer-coated (alkali-resistant) fiberglass mesh.
1. PermaBASE™ Cement Board Tape, [2 inch][4 inch].

2.10 JOINT COMPOUNDS

A. Setting Type Compound
1. Field mixed quick setting and hardening: ASTM C475/C475M.
a. ProForm® Quick Set™ Setting Compound.
2. Field mixed quick setting and hardening; fire resistant: ASTM E814.
a. ProForm® Quick Set™ Fire and Smoke Stop 90 Setting Compound.

B. Drying Type Compound:
1. Ready mix, vinyl base: ASTM C475/C475M.
a. ProForm® Multi-Use Joint Compound.
b. ProForm® All Purpose Joint Compound.
c. ProForm® Ultra Lite® All Purpose Joint Compound.
d. ProForm® All Purpose Machine Grade Joint Compound.
e. ProForm® Lite Blue™ Joint Compound.
f. ProForm® Lite Joint Compound.
2. Ready mix, vinyl base, reduced dust: ASTM C475/C475M.
a. ProForm® All Purpose with Dust-Tech® Joint Compound.
b. ProForm® Lite with Dust-Tech®.
c. ProForm® Lite Blue™ with Dust-Tech® Joint Compound.
1) Mold/Mildew Resistance: ASTM D3273; Score of 10.
2) Mold/Mildew Resistance: ASTM G21, Score of 0.
3. Ready mix, vinyl base, topping compound: ASTM C475/C475M.
a. ProForm® Topping Joint Compound.
4. Ready mix, vinyl base, embedding tape and trim: ASTM C475/C475M.
a. ProForm® Taping Joint Compound.
b. ProForm® Taping Lite Joint Compound.
5. Ready mix, vinyl base, specialty: ASTM C475/C475M.
a. ProForm® All Purpose Texture Grade Joint Compound.
b. ProForm® All Purpose Heavy Viscosity Joint Compound.
c. ProForm® Tinted Lite™ Joint Compound.
d. ProForm® Concrete Cover Joint Compound.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Limitations:
   1. Comply with ASTM C840 for gypsum board manufacturer's written instructions, whichever are more stringent:
      e. Do not install paper faced gypsum panels until installation areas are enclosed and conditioned.

B. Room Temperatures: Maintain minimum 40 degrees F (4 degrees C). For adhesive attachment and finishing of gypsum board, maintain minimum 50 degrees F (10 degrees C) for 48 hours before application and continuously after until dry. Do not exceed 95 degrees F (35 degrees C) when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

D. Do not install panels that are wet, moisture damaged, and mold damaged:
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.2 EXAMINATION

A. Examine areas and substrates including welded hollow metal frames, cast in anchors, and structural framing, for compliance with requirements and other conditions affecting performance. Proceed with installation after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.4 INSTALLATION

A. Installation Standard: ASTM C754, except comply with framing sizes and spacing indicated. Install in accordance with:
   1. Manufacturer recommendations.
   2. ANSI A108.
   3. GA-214.
   4. GA-216.

B. Gypsum Board Assemblies: Comply with requirements in ASTM C840 applicable to framing installation.

C. Gypsum Board:
   1. Install interior gypsum board where indicated on drawings.
      a. Single Layer Application:
         1) On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.

2) On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire resistance rated assembly, and minimize end joints. Stagger abutting end joints not less than one framing member in alternate courses of panels.
3) Fastening Methods: Apply gypsum panels to supports with steel drill screws.

b. Multilayer Application:
1) On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
2) On Z shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
3) Fastening Methods: Fasten base layers and face layers separately to supports with screws.

D. Cementitious Backer Units: ANSI A108.11; install where indicated with 1/4-inch (6.4 mm) gap where panels abut other construction or penetrations. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

E. Exterior Gypsum Board Soffits:
1. Apply panels perpendicular to supports, with end joints staggered and located over supports:
a. Install with 1/4 inch open space where panels abut other construction or structural penetrations.
b. Fasten with corrosion-resistant screws.

F. Trim Accessories:
1. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Attach trim according to manufacturer's written instructions:
a. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.
b. Exterior Trim:
1) Install in the following locations:
a) Cornerbead: Use at outside corners.
b) LC Bead: Use at exposed panel edges.
c. Interior Trim - Install in the following locations:
1) Cornerbead: Use at outside corners, unless otherwise indicated.
2) Bullnose Bead: Use at outside corners.
3) LC Bead: Use at exposed panel edges.
4) L Bead: Use where indicated or necessary.
5) U Bead: Use at exposed panel edges.

G. Gypsum Board Finishing:
1. Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces:
a. Prefill open joints, rounded or beveled edges, and damaged surface areas.
b. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
c. Gypsum Board Finish Levels - Finish panels to levels indicated below and according to ASTM C840:

1) Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2) Level 2: Panels that are substrate for tile.
3) Level 3: Surfaces be coated with drywall primer prior to final finishes. Heavy or medium texture finishes before final painting, or where heavy-grade wall coverings are to be applied as the final decoration. This level of finish is not recommended where smooth painted surfaces, or light to medium weight wall coverings as specified.
4) Level 4: For surfaces receiving wall covering and flat paints.
5) Level 5: For surfaces receiving gloss or semigloss paint and surfaces subjected to severe lighting. To be used in Kitchen areas and food service areas only.

d. Glass Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
e. Glass Mat Faced Panels: Finish according to manufacturer's written instructions.

H. Installation Tolerances:
1. Suspension System: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.
2. Installation Tolerances, Suspension System: Install suspension systems level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.5 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged:
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 09 51 00 ACOUSTICAL CEILING PANELS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Acoustical panels.
   2. Concealed and exposed suspension systems for ceilings.
   3. Ceiling panel for food service area.
   4. Accessories necessary for a complete installation.

1.3 SUBMITTALS

A. Product Data: Technical data for each product including installation instructions.

B. Samples:
   1. Acoustic Panel: Set of 6-inch (150 mm) square samples of each type, color, pattern, and texture.
   2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch (300 mm) long samples of each type, finish, and color.

C. Coordination Drawings:
   1. Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
      a. Suspended ceiling components.
      b. Structural members to which suspension systems will be attached.
      c. Size and location of initial access modules for acoustical panels.
      d. Items penetrating finished ceiling including but not limited to the following:
         1) Lighting fixtures.
         2) Air outlets and inlets.
         3) Speakers.
         4) Sprinklers.
         5) Access panels.
      e. Perimeter moldings.

D. Maintenance Data: Manufacturer data for finishes for inclusion in maintenance manuals.

E. Submit one copy of ICC-ES Reports.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Building Code:
      a. Comply with applicable requirements of the California Building Code (CBC) for interior finishes:
         1) DSA Interpretation of Regulations – IR 25-2.13 Metal Suspension Systems for Lay-in Panel Ceilings.
         2) California Building Code.

3) Chapter 19, California Building Code.
4) Chapter 23, California Building Code
5) Acoustical Panel Standard: ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance:
a) Mounting Method for Measuring NRC: Plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E795.

2. Surface Burning Characteristics:
a. Ceiling panels with surface burning characteristics complying with CBC and ASTM E1264 for Class A materials determined by testing identical products in accordance with ASTM E84:
1) Flame Spread Index: 25 or less.
2) Smoke Developed Index: 450 or less.
3. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE 7.
4. Fire Resistance Ratings: Comply with ASTM E119; testing by qualified testing agency. Identify products with appropriate markings of applicable testing agency. Indicate design designations from UL *Fire Resistance Directory* or from the listings of another qualified testing agency.

B. Source Limitations:
1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
2. Suspension System: Obtain each type through one source from a single manufacturer.

C. Comply with applicable regulations regarding toxic and hazardous materials:
1. Coating Based Antimicrobial Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment; and showing no mold or mildew growth when tested in accordance with ASTM D3273.
2. Panel Based Antimicrobial Treatment: Provide acoustical panels manufactured with antimicrobial treatment in the panels.

D. Pre-installation Conference: Conduct conference at site.

1.5 WARRANTY

A. Standard Ceiling Panels: Warrant ceiling panels to be free from sagging, warping, shrinking, buckling, or delaminating as a result of manufacturing defects for a period of one (1) year from the date of Substantial Completion.

B. Sag Resistant Ceiling Panels: warrant products to be free from sagging, warping, shrinking, buckling, or delaminating as a result of manufacturing defects for a period of ten (10) years from the date of Substantial Completion.

C. Standard Suspension System: Suspension systems shall be warranted to be free from defects in material or factory workmanship and shall not incur 50 percent red rust as defined by ASTM B117 test procedures for a period of ten (10) years from the date of Substantial Completion.

D. Suspension system / ceiling panels: Provide manufacturers standard 15 year warranty for suspension systems when used in combination with same manufacturers sag resistant ceiling panels. Ceiling panels to be free from sagging, warping, shrinking, buckling, or delaminating as a result of manufacturing defects. Suspension systems shall not incur 50 percent red rust as defined by ASTM B117 test during the period of the warranty, extra materials.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension system components, and accessories to site in original, unopened packages and store in a fully enclosed, conditioned space protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, allow panels to attain room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers are subject to compliance with requirements; provide ceiling panels and grid systems by one of the following:
   1. Concealed and Exposed Suspension Grid:
      a. Armstrong World Industries, Inc.
      b. CertainTeed Corporation.
      c. Chicago Metallic; Rockfon (Roxul Inc.).
      d. Hunter Douglas.
      e. USG Interiors.
   2. Acoustical Ceiling Panel:
      a. Armstrong World Industries, Inc.
      b. CertainTeed Corporation.
      c. Rockfon (Roxul Inc.).
      d. Tectum Inc.
      e. USG Interiors.
   3. Molding and Edge Trim:
      a. Armstrong World Industries, Inc.
      b. CertainTeed Corp.
      c. Chicago Metallic Corporation.
      d. Fry Reglet Corporation.
      e. Gordon, Inc.
      f. USG Interiors, Inc.; Subsidiary of USG Corporation.
   4. Acoustical Sealant for Exposed and Concealed Joints:
      a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
      b. USG Corporation; SHEETROCK Acoustical Sealant.
   5. Acoustical Sealant for Concealed Joints:
      a. Henkel Corporation; OSI Pro-Series SC-175 Acoustical Sound Sealant.
      b. Pecora Corporation; AIS-919.

B. Acoustical Panel Colors and Patterns:
   1. Match appearance characteristics indicated for each product type:
      a. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E1264 and not manufacturers' proprietary product designations, provide products selected by Architect that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.2 METAL SUSPENSION SYSTEM

A. Metal Suspension System:

1. Direct hung metal suspension systems of types, structural classifications, and finishes indicated complying with applicable requirements in ASTM C635/C635M:
   a. High Humidity Finish:
      1) Comply with ASTM C635/C635M requirements for Coating Classification for Severe Environment Performance where high humidity finishes are indicated.
   b. Attachment Devices - Size for five times the design load indicated in ASTM C635/C635M, Table 1 Direct Hung, unless otherwise indicated. Comply with seismic design requirements:
      1) Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E488 or ASTM E1512 as applicable, conducted by a qualified testing and inspecting agency:
         a) Type: Cast in place, postinstalled expansion or postinstalled bonded anchors.
         b) Corrosion Protection: Carbon steel components zinc plated to comply with ASTM B633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
         c) Corrosion Protection: Stainless steel components complying with ASTM F593 and ASTM F594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchor.
         d) Corrosion Protection: Components fabricated from nickel copper alloy rods complying with ASTM B164 for UNS No. N04400 alloy.
      2) Power Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E1190, conducted by a qualified testing and inspecting agency.
2. Wire Hangers, Braces, and Ties:
   a. Zinc Coated, Carbon Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
   b. Stainless Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
   c. Nickel Copper Alloy Wire: ASTM B164, nickel copper alloy UNS No. N04400.
   d. Size: Select wire diameter so its stress at three times hanger design load (ASTM C635/C635M, Table 1 Direct Hung) will be less than yield stress of wire, but provide not less than 0.106 inch (2.69 mm) diameter wire.
3. Hanger Rods and Flat Hangers: Mild steel, zinc coated or protected with rust inhibitive paint.
4. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04 inch (1 mm) thick, galvanized steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation; with bolted connections and 5/16 inch (8 mm) diameter bolts.
5. Hold Down Clips: Provide hold down clips spaced 24 inches (610 mm) o.c. on all cross tees in areas with exterior opening larger than 48” x 96”.
6. Impact Clips: Provide impact clip system designed to absorb impact forces against acoustical panels in Gymnasiums.
7. Aluminum cap for use over steel grid in kitchen areas or where shown on drawings or required.

B. Metal Suspension Systems:
   1. Wide Face, Steel Capped, Double Web, Steel Suspension System:
      a. Main and cross runners roll formed from cold rolled steel sheet; prepainted, electrolytically zinc coated, or hot dip galvanized according to ASTM A653/A653M, not less than G30 (Z90) coating designation; with prefinished 15/16 inch (24 mm)

wide metal caps on flanges:
1) Structural Classification: Heavy duty system.
2) Face Design: Flat, flush.
3) Cap Finish: Color selected by Architect.

2. Narrow Face, Steel Capped, Double Web, Steel Suspension System:
   a. Main and cross runners roll formed from cold rolled steel sheet; prepainted, electrolytically zinc coated, or hot dip galvanized according to ASTM A653/A653M, not less than G30 (Z90) coating designation; with prefinished, cold rolled, 9/16 inch (15 mm) wide metal caps on flanges:
      1) Structural Classification: Intermediate-duty system.
      2) Face Design: Flat, flush.
      3) Cap Finish: Color selected by Architect.

2.3 ACOUSTICAL PANELS

A. Acoustic Panel Type I:
1. Basis of Design Product: School Zone Fine Fissured No. 1713 by Armstrong World Industries.
2. Classification - Provide panels complying with ASTM E1264 for type, form, and pattern:
   a. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
   b. Pattern: CE (perforated, small holes and lightly textured).
3. Color: White.
4. LR: Not less than 0.85.
5. NRC: Not less than 0.70.
6. CAC: Not less than **35**.
7. Edge/Joint Detail: Square.
8. Thickness: 3/4 inch (19 mm).
9. Modular Size: 24 by 24 inches (610 by 610 mm).
10. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D3273 and evaluated according to ASTM D3274 or ASTM G21.
11. Typical Location: Primary learning areas and classrooms.

B. Acoustic Panel Type II:
1. Basis of Design Product: Painted Nubby Open Plan No. 3102 by Armstrong World Industries.
2. Classification - Provide panels complying with ASTM E1264 for type, form, and pattern:
   a. Type and Form: Type XII, glass fiber base with membrane faced overlay; Form 2, cloth.
   b. Pattern: E (lightly textured).
   c. Color: White.
3. LR: Not less than 0.84.
4. NRC: Not less than 0.95.
5. Edge/Joint Detail: Square.
6. Thickness: 1 inch (25 mm).
7. Modular Size: 24 by 24 inches (610 by 610 mm).
8. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D3273 and evaluated according to ASTM D3274 or ASTM G21.
9. Typical Location: Music rooms, performing arts rooms.

C. Acoustic Panel Type III:

1. Basis of Design Product: Clean Room VL No. 868 by Armstrong World Industries.
2. Classification - Provide [fire resistance rated] panels complying with ASTM E1264 for type, form, and pattern:
   a. Type and Form: Type IV, mineral base with membrane faced overlay; washable vinyl film overlay.
   b. Pattern: GH (smooth and printed).
   c. Color: White.
3. LR: Not less than 0.80.
4. CAC: Not less than 40.
5. Edge/Joint Detail: Square.
6. Thickness: 5/8 inch (15 mm).
7. Modular Size: 24 by 24 inches (610 by 610 mm).
8. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D3273 and evaluated according to ASTM D3274 or ASTM G21.
9. Typical Location: Food preparation areas.

2.4 MOLDING, TRIM AND ACCESSORIES

A. Shadow Molding: Where an acoustical lay in ceiling abuts a gypsum board ceiling in the same plane, provide a "W" shaped reveal or "shadow" molding similar to Armstrong Shadow Molding No. 7873.

B. Light Fixture Protection:
   1. Manufacturer: Thermafiber Light Protection Kit by Owens Corning or Type 5/8 or 3/4 P(S) by Armstrong World Industries.
   2. Fire Resistance Rating: Same as ceiling assembly rating.
   3. Locations: At fixtures reinstalled in fire rated ceiling assemblies.

C. Roll Formed, Sheet Metal Edge Moldings and Trim:
   1. Type and profile for standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color used for exposed flanges of suspension system runners:
      a. Provide edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
      b. For lay in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
      c. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

D. Extruded Aluminum Edge Moldings and Trim:
   1. Where indicated, provide extruded aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following:
      a. Aluminum Alloy: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of aluminum extrusions complying with ASTM B221 for Alloy and Temper 6063-T5.
      b. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.
      c. Baked Enamel or Powder Coat Finish: Minimum dry film thickness of 1.5 mils (0.04 mm). Comply with ASTM C635/C635M and coating manufacturer's written

instructions for cleaning, conversion coating, and applying and baking finish.

E. Acoustical Sealant:
1. Comply with ASTM C834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90:
a. Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant.
b. Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Limitations:
1. Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use:
a. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

3.2 EXTRA MATERIALS

A. Furnish extra materials matching products installed and packaged with protective covering for storage and identified with labels describing contents:
1. Acoustical Ceiling Panels: Full size panels equal to 2 percent of quantity installed.
2. Suspension System Components: Quantity of each exposed component equal to 2 percent of quantity installed.
3. Hold Down Clips: Equal to 2 percent of quantity installed.
4. Impact Clips: Equal to 2 percent of quantity installed.

3.3 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut for compliance with requirements specified that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation after correcting unsatisfactory conditions.

3.4 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less than half width panels at borders, and comply with layout shown on reflected ceiling plans.

3.5 INSTALLATION

A. Install acoustical panel ceilings to comply with ASTM C636/C636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA *Ceiling Systems Handbook*:

1. Fire Rated Assembly: Install fire-rated ceiling systems according to tested fire rated design.

B. Suspend ceiling hangers from building's structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
   2. Splay hangers where required and, if permitted with fire resistance rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
   4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
   5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
   6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast in place hanger inserts, postinstalled mechanical or adhesive anchors, or power actuated fasteners that extend through forms into concrete.
   7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
   8. Do not attach hangers to steel deck tabs.
   9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
   10. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
   11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast in place or postinstalled anchors.

D. Panel Accessibility: Install panels downward accessible by disengaging hinge support rail on one side of panel from the T Bar Flange or optional A Mount rail flange without the use of tools, for access without removal of panel from the ceiling.

E. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels:
   1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
   2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
   3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

F. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

G. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit:
   1. Arrange directionally patterned acoustical panels with pattern running in one direction parallel to long axis of space.
   2. For square edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
   3. For reveal edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
   4. For reveal edged panels on suspension system members with box shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.
   5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
   6. Install hold-down clips in areas indicated, in areas with exterior opening larger than 48” x 96”, where required by authorities having jurisdiction, and for fire resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.
   7. Install clean room gasket system in areas indicated, sealing each panel and fixture as recommended by panel manufacturer's written instructions.
   8. Protect lighting fixtures and air ducts to comply with requirements indicated for fire resistance rated assembly.

3.6 FIRE RATING SCHEDULE

A. Refer to UL Assemblies Drawings for Fire Rating requirements of ceiling materials at rated floor and roof assemblies.

3.7 FIELD QUALITY CONTROL

A. Special Inspections:
   1. Engage a qualified special inspector to perform the following special inspections:
      a. Compliance of seismic design.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.

C. Perform the following tests and inspections of completed installations of acoustical panel ceiling hangers and anchors and fasteners in successive stages. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations show compliance with requirements:
   1. Extent of Each Test Area:
      a. When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed:
         1) Within each test area, testing agency will select one of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf (890 N) of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf (1957 N) of tension.
         2) When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.

D. Acoustical panel ceiling hangers and anchors and fasteners will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.8 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 00

SECTION 09 65 13.13 RESILIENT BASE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Rubber base.
   2. Accessories necessary for a complete installation.

1.3 SUBMITTALS

A. Product Data: Technical data for each type of product including manufacturer's installation instructions.

B. Samples: Sample of Base Selected or Color Chart if none selected.

C. Maintenance Data: Submit for inclusion in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Entity having minimum 5 years documented experience who employs workers competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store base and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 degrees F (10 degrees C) or more than 85 degrees F (29 degrees C). Store floor tiles on flat surfaces.

PART 2 PRODUCTS

2.1 MATERIALS

A. Basis of Design Product:
   1. Manufacturers and tile series, pattern, and color selections are indicated in the Finish Schedule and are a basis of design. Subject to compliance with requirements, provide product indicated in Finish Schedule or comparable product by one of the following:
      a. Burke Flooring; Type TS (Basis of Design)
      b. Flexco Floors.
      c. Johnsite, a division of Tarkett Group.
      d. Mannington Commercial.
      e. Roppe.

B. Rubber Base - ASTM F1861:
   1. Material: Rubber, vulcanized, Type TS, Group I, Styles A and B.
   2. Manufacturing Method: Group I (solid, homogeneous).

3. Style: Topset cove; minimum 100 foot coil, cut to length required.
4. Minimum Thickness: 0.125 inch (3.2 mm).
5. Color: Selected by Architect.
6. Height: 4 inches, unless otherwise indicated on drawings.
7. Outside Corners: Job formed.
8. Inside Corners: Job formed.

C. Adhesives: Water resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F (21 degrees C) or more than 85 degrees F (29 degrees C), in spaces to receive floor tile during the following time periods:
1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F (13 degrees C) or more than 95 degrees F (35 degrees C).

C. Close spaces to traffic for 48 hours after installation.

3.2 EXAMINATION

A. Examine substrates for compliance with requirements for maximum moisture content and other conditions affecting performance of the work:
1. Verify that finishes of substrates comply with tolerances and other requirements specified for other work and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation after correcting unsatisfactory conditions. Installation of resilient flooring and accessories indicates acceptance of surfaces and conditions.

3.3 PREPARATION

A. Immediately before installation, sweep clean substrates to be covered by resilient base.

3.4 INSTALLATION

A. Comply with manufacturer's written instructions for installing flooring. Scribe and cut flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Extend flooring into toe spaces, door reveals, closets, and similar openings.

B. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on flooring as marked on substrates. Use chalk or other nonpermanent marking device.

C. Resilient Base:
1. Comply with manufacturer's written instructions for installing resilient base. Apply

resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required:

a. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
b. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
c. Do not stretch resilient base during installation.
d. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
e. Preformed Corners: Install preformed corners before installing straight pieces.
f. Job Formed Corners:
    1) Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
    2) Form without producing discoloration (whitening) at bends.
    3) Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length:
        a) Miter or cope corners to minimize open joints.

END OF SECTION 09 65 13.13

SECTION 09 65 23 LUXURY VINYL TILE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes requirements limited to:
   1. Luxury vinyl floor tile.
   2. Accessories necessary for a complete installation.

B. Related Sections:
   1. Section 03 30 00: Cast-In-Place Concrete.
   2. Section 09 65 13.13: Resilient Base.

1.3 SUBMITTALS

A. Product Data: Technical data for each type of product including manufacturer's installation instructions.

B. Shop Drawings - For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built in furniture, cabinets, and cutouts:
   1. Show details of special patterns.

C. Samples - Full size units of each color and pattern of floor tile required:
   1. Luxury Vinyl Tile (LVT) flooring: Tile in each size and color selected and 12-inch-long piece of base material in each color selected for approval.

D. Product Schedule: Submit for floor tile using same designations indicated on Drawings.

E. Maintenance Data: Submit for inclusion in maintenance manuals.

F. Reports: Certified Moisture Testing Results.

G. Sample of luxury vinyl tie for Owner's approval must be submitted 7 days prior to bid date. Luxury Vinyl Tile must meet or exceed minimum specifications below.

1.4 WARRANTY

A. Warranty to be sole source responsibility of the Manufacturer. Second source warranties and warranties that involve parties, other than the resilient manufacturer, are unacceptable.

B. If the product fails to perform as warranted when properly installed and maintained, the affected area will be repaired or replaced.

C. Warranty shall be for a period of not less than ten (10) years.

D. The non-prorated ten (10) year minimum warranty shall cover against and specifically define the following:

1. Manufactured defects:
   a. Free from manufactured defects in a period of warrant.
2. Wear:
   a. Wear due to normal traffic.

1.5 DELIVERY

A. Deliver goods to job site in manufacturer's bundles, clearly marked as to size, dye lot and materials.

B. Schedule delivery to allow sufficient time for examination of materials by Owner five (5) days before installation begins.

PART 2 PRODUCTS

2.1 MATERIALS

A. Basis of Design
   1. Manufacturer: Shaw Contract
   2. Collection: Grain + Pigment
   3. Style Number 0364V
   4. Construction: Heavy Comm Luxury Vinyl Tile w/ In-Step Backing
   5. Class / ASTM F1700 Class III, Type B
   6. Finish: ExoGuard

B. Performance Requirements
   1. Class I - Interior Floor Finish per NFPA 101 6.5.2
   2. Critical Radiant Flux - Minimum 0.45 watts per square centimeter per NFPA 253 "Standard Method of Test for Critical Radiant Flux of Floors Covering Systems Using a Radiant Heat Energy Source".
   3. Class A Interior Finish Material per ASTM E84 - "Method of Test for Surface Burning."
   4. Characteristics of Building Materials:
      b. Flame Spread – 0.
      c. Smoke Developed – 450.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F (21 degrees C) or more than 85 degrees F (29 degrees C), in spaces to receive floor tile during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F (13 degrees C) or more than 95 degrees F (35 degrees C).

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Where demountable partitions, cabinets, and similar items are indicated for installation on top of resilient tile flooring, install tile before these items are installed.

F. Do not install flooring over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by flooring manufacturer's recommended bond and moisture test.

G. Install flooring after other finishing operations, including painting, have been completed.

3.2 EXTRA STOCK

A. Furnish extra materials matching products installed and packaged with protective covering for storage and identified with labels describing contents:
   1. LVT Flooring: 1 percent of quality installed or 2 full unopened containers, whichever is greater.

3.3 EXAMINATION

A. Examine substrates for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work:
   1. Verify that finishes of substrates comply with tolerances and other requirements specified for other Work and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation after correcting unsatisfactory conditions. Installation of resilient flooring and accessories indicates acceptance of surfaces and conditions.

3.4 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates - Prepare according to ASTM F710:
   1. Verify substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
   4. Moisture Testing - Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
      a. Perform anhydrous calcium chloride test according to ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
      b. Perform relative humidity test using in situ probes according to ASTM F2170. Proceed with installation only after substrates have a maximum **95** percent relative humidity level.
   5. Bond Test: Bond 3' x 3' panels spaced 50 feet apart throughout subfloor area. After moisture test proves floor acceptably dry, install panels using adhesive. If panels are securely bonded after 72 hours, subfloor is sufficiently clean of foreign materials for satisfactory installation of resilient flooring.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are the same temperature as the space where they are to be installed:
   1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.5 INSTALLATION

A. Comply with manufacturer's written instructions for installing flooring. Scribe and cut flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Extend flooring into toe spaces, door reveals, closets, and similar openings.

B. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on flooring as marked on substrates. Use chalk or other nonpermanent marking device.

C. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one/half tile at perimeter:
   1. Lay tiles square with room axis.

D. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles:
   1. Lay tiles with grain running in one direction.

E. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built in furniture, cabinets, pipes, outlets, and door frames.

F. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

H. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

I. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

J. Floor Tile - Comply with manufacturer's written instructions for installing floor tile:
   1. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one/half tile at perimeter:

a. Lay tiles square with room axis unless pattern indicated for an area.

2. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles. Lay tiles with grain running in one direction.

K. Resilient Accessories - Comply with manufacturer's written instructions for installing resilient accessories:

1. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.6 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish. Apply two coat(s).

E. Sealers and Finish Coats:

1. Remove soil, visible adhesive, and surface blemishes from resilient terrazzo floor tile surfaces before applying liquid cleaners, sealers, and finish products:
   a. Sealer: Apply two base coats of liquid sealer.
   b. Finish: Apply two coats of liquid floor finish.

F. Cover floor tile until Substantial Completion.

G. Clean floor surfaces not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products according to manufacturer's written recommendations:

1. Before cleaning, strip protective floor polish.
2. Reapply polish to floor surfaces to restore protective floor finish according to flooring manufacturer's written recommendations.

END OF SECTION 09 65 23

SECTION 09 67 00 EPOXY FLOORING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Epoxy floor system.
   2. Accessories necessary for a complete installation.

1.3 DEFINITIONS

A. Comparable Product: Product demonstrated and approved through submittal process, or where indicated as a produce substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

1.4 SUBMITTALS

A. Product Data: Technical data for each type of product indicated include manufacturer's technical data, application instructions, and recommendations for each flooring component required.

B. Samples - Submit flooring system required, 6 inches (150 mm) square, applied to a rigid backing:
   1. Two samples indicating range of slip resistant textures.
   2. Two samples of actual color and texture selected by the Architect.

C. Reports and Certificates:
   1. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

D. Maintenance Data: Submit data for flooring system to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Building Code: Comply with applicable requirements of the CBC for interior floors.
   2. Fire Test Response Characteristics: Determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
   3. Accessibility Requirements - Comply with applicable requirements:
      a. U.S. Architectural and Transportation Barriers Compliance Board Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).
      b. 2010 ADA regulations.
      c. ICC/ANSI A117.1 Accessible and Useable Building and Facilities.
   4. Flammability: Self-extinguishing according to ASTM D635.

B. Installer Qualifications: Installer having minimum 5 years documented experience in the installation of epoxy floors and who is a manufacturer authorized representative trained and

approved for installation of flooring systems required. Engage installer certified in writing by floor manufacturer as qualified to apply flooring systems indicated.

C. Source Limitations: Obtain primary flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

D. Pre-installation Conference: Conduct conference at site.

1.6 WARRANTY

A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of (1) full year from date of installation or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

PART 2 PRODUCTS

2.1 MATERIALS

A. Basis of Design – **Dur-A-Quartz Epoxy Flooring as manufactured by Dur-A-Flex**; subject to compliance with requirements, provide products by one of the following:
1. BASF Corporation; Construction Systems.
2. Crossfield Products Corp.
3. Sherwin-Williams Company, General Polymers.
4. Sika Corporation; Flooring.

B. Flooring System: 1/8th inch epoxy mortar base with decorative quartz broadcast.

C. Primer Formulation Description Basis of Design: DUR-A-SHIELD OR DUR-A-GLAZE WB PRIMER squeegee applied and back rolled.

D. Formulation Description - Body Coat HRI Base:
1. Resin: 100% solid 3-part Epoxy Mortar troweled at 3/16th inch.
2. Formulation Description: Comprised of a three-component mortar, consisting of pigmented epoxy resin, curing agent, and pigmented blended aggregates.
3. Application Method - Troweled Mortar and added quarts broadcast:
   a. Mortar: Uniformly Trowel 3/16th inch mortar over substrate; Add Stonshield undercoat then broadcast decorative quartz into undercoat until refusal and seal with CE4 Epoxy sealer.

E. System Physical Properties - Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:
1. Static load Limit: 0.004in/0.1mm.
2. Resistance to Heat: Delta E>8 per ASTM F970.
3. Hardness: 85 Min. per ASTM D2240/Shore A Durometer.

4. Residual Indentation: 1% thickness per ASTM F- 1914.
5. Noise Reduction Coefficient: 0.05 per ASTM C-423.
6. Abrasion Resistance: 0.01gm per ASTM D-3389, H-18 500g, 1000 cycles.
7. Fire Resistance: Class 1, Per ASTM E-648.

F. System Characteristics:
1. Color and Pattern: To be determined by Architect.
2. Wearing Surface: ½ texture 2.
3. Integral Cove Base: 6 inches high with zinc termination strip.
4. Overall System Thickness: 3/16 inch (4.7625 mm).

G. Antimicrobial Additive: Antimicrobial chemical additive to control growth of most bacteria, fungi, algae and actinomycetes.

H. Primer/Waterproofing Membrane: Type recommended by flooring manufacturer for substrate and flooring system indicated.

I. Patching and Fill Material: Resinous product approved by flooring manufacturer and recommended by manufacturer for application indicated.

J. Undercoat:
1. Resin: Stonshield Undercoat.
2. Formulation Description: Epoxy.
3. Type: Clear.
4. Finish: Gloss.
5. Number of Coats: two.

K. Topcoats:
1. Resin: Epoxy.
2. Type: Two-component 100% solids.
3. Type: Clear.
4. Finish: Gloss.
5. Number of Coats: two.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Environmental Limitations: Comply with flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and conditions affecting resinous flooring application.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.

C. Close spaces to traffic during flooring application and for 24 hours after application unless manufacturer recommends a longer period.

3.2 PREPARATION

A. Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.

B. Concrete Substrates - Provide sound concrete surfaces free of laitance, glaze,

efflorescence, curing compounds, form release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring:

1. Remove existing floor covering, adhesives, and contaminates. Ensure existing concrete floor is ready to receive epoxy floor covering.
2. Roughen concrete by Shot Blasting (mechanical preparation only) substrates according to manufacturer's written instructions.
3. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
4. Verify that concrete substrates are dry and moisture vapor emissions are within acceptable levels according to manufacturer's written instructions:
   a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) of slab area in 24 hours.
   b. Plastic Sheet Test: ASTM D4263. Proceed with application after testing indicates absence of moisture in substrates.
   c. Relative Humidity Test: Use in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
5. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Patching and Filling - Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions:
   1. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

D. Epoxy Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

3.3 APPLICATION

A. Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated:
   1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
   2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
   3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

B. Primer/Waterproofing Membrane - Apply primer or waterproofing membrane over entire substrate surface in manufacturer's recommended thickness:
   1. Apply to integral cove base substrates.

C. Integral Cove Base:
   1. Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Do not broadcast into cove. Mix quartz aggregates and add thixotropic and hand trowel. Round internal and external corners:
      a. Integral Cove Base: 6 inches (100 mm) high.

D. Trowel HRI Base to 3/16th inch then apply Stonshield undercoat.

E. Quartz Granules: Broadcast Quartz into Undercoat. Scrape off and vacuum up excess aggregate.

F. Topcoats: Trowel or squeegee apply clear epoxy resin coat topcoats indicated for flooring system and at spreading rates recommended in writing by manufacturer and to produce wearing surface indicated.

3.4 PROTECTION

A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 09 67 00

SECTION 09 68 01 CARPETING WALK-OFF-MATS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Walk Off Carpet.
   2. Accessories necessary for a complete installation.

B. Related Sections;
   1. Section 03 30 00: Cast-in-Place Concrete.

1.3 SUBMITTALS

A. Product Data:
   1. Technical data including installation recommendations for each type of substrate:
      a. Carpet:
         1) For each type indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance.

B. Samples:
   1. For each products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules:
      a. Carpet: 12 inch (300 mm) square Sample from approved color and product of carpet.
      b. Exposed Edge, Transition, and Other Accessory Stripping: 12 inch (300 mm) long Samples.
      c. Mitered Carpet Border Seam: 12 inch (300 mm) square Sample. Show carpet pattern alignment.
      d. Carpet base and accessory samples.

C. Product Test Reports: For carpet and carpet cushion, for tests performed by a qualified testing agency.

D. Shop Drawings: Showing extent of product, seam direction, and location and type of carpet accessories. Submittal to indicate columns, doorways, enclosing walls or partitions, casework, and locations where cutouts are required.

E. Maintenance Data:
   1. For carpet to include in maintenance manuals. Include the following:
      a. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
      b. Precautions for cleaning materials and methods that could be detrimental to carpet and carpet cushion.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Fire Test Response Characteristics:
      a. Provide products with the critical radiant flux classification determined by testing identical products in accordance with ASTM E648:
         1) Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
   2. Accessibility Requirements:
      a. Comply with applicable requirements:
         1) Americans with Disabilities Act of 1990, as amended:
            a) ADA Title II Regulations & the 2010 ADA Standards for Accessible Design.
            b) 2010 ADA regulations.
         2) 2022 California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA):
            a) CBC Chapter 11B, Access to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.
   3. AQMD - Air Quality Management District, Local Regulations.
   4. SCAQMD – South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications.
   5. CRI – Carpet and Rug Institute Green Label Plus.
   6. Carpet shall have level loop, textured loop, or level-cut/uncutpile texture, firm cushion, pad or backing (or no cushion or pad) and maximum pile height of 1/2 inch in accordance with CBC Section 11B-302.2. Carpet edges shall comply with CBC 11B-302.2 and carpet trim to CBC Section 11B-303.

B. Installer Qualifications: Installer having minimum 5 years documented experience as a commercial carpet installer, who is certified by the International Certified Floorcovering Installers Association at the Commercial II or higher certification level.

C. Contractor is required to achieve the specified concrete moisture content prior to installation of all flooring materials or use a flooring manufacture approved moisture barrier prior to installation of all flooring products.

D. Pre-installation Conference:
   1. Pre-Installation conference to be conducted at project site.

1.5 WARRANTY

A. Written warranty in which manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period:
   1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excessive surface wear, excess static discharge, and delamination.
   3. Warranty Period: 25 years from date of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

B. Store in a dry location between 65 degrees F and 90 degrees F and a relative humidity below 65%. Protect from damage and soiling. Stack carpet rolls horizontally, elevated above slab level on a flat surface, stacked no higher than two rolls.

C. Store materials in area of installation for minimum period of 48 hours prior to installation.

D. Protect carpet from damage, dirt, stains, and moisture.

PART 2 PRODUCTS

2.1 MATERIALS

A. Basis of Design:
   1. Carpet series and patterns indicated on Finish Schedule. Subject to compliance with requirements, provide products by one of the following:
      a. Tandus-Centiva.
      b. Mannington Mills.
      c. Mohawk Group.
      d. Patcraft.
      e. Shaw Contract Group.

B. Carpet (Walk-Off):
   1. Type: Patterned carpet tiles.
   2. Construction: Step Up II Walk Off Carpet Tile
   3. Color(s): 989 Obsidian.
   4. Locations: As shown on Drawings.
   5. Approved Product/Manufacturer: “Abrasive Action” as manufactured by Tandus (Collins and Aikman) Commercial Floor Systems, Dalton GA; (404) 259-9711.

C. Applied Soil Resistance Treatment: Standard with manufacturer.

D. Antimicrobial Treatment: Standard with manufacturer.

E. Adhesives: Water resistant, mildew resistant, nonstaining, pressure sensitive type to suit products and subfloor conditions indicated, complying with flammability requirements for installed carpet and is recommended by carpet manufacturer for releasable installation.

F. Trowelable Leveling and Patching Compounds: Latex modified, hydraulic cement based formulation provided or recommended by carpet cushion manufacturer.

G. Adhesives: Water resistant, mildew resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet and carpet cushion manufacturers.

H. Extra Carpet: After completion of the carpet installation, the carpet subcontractor shall provide an additional three (3) percent of total yards installed of each carpet specified to the Owner for future carpet replacement that may be required. This extra stock is to be unused rolls, tiles, and mats and does not include scraps.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet and carpet cushion until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.

C. Do not install carpet and carpet cushion over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.

B. Concrete Subfloors:
   1. Verify that concrete slabs comply with ASTM F710 and the following:
      a. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond.
      b. Prior to delivery of flooring materials, contractor shall conduct Calcium Chloride “dome” test to verify that concrete floors are dry with maximum moisture vapor emissions of 3 lbs. per 1000 square feet. in 24 hours, and exhibit negative alkalinity, carbonation or dusting. Apply moisture test in four (4) different areas of each floor location with at least one test for each 1,000 square feet of floor area.
      c. Prior to delivery of carpeting, conduct Relative Humidity Test Method in accordance with ASTM F2170 using a Wagner Rapid RH probe to verify relative humidity and surface pH of concrete floor slabs, the method:
         1) Requires drilling holes at diameter not to exceed outside diameter of probe by more than 0.04 inch to depth equal to 40 percent of slab's thickness (elevated structural slab shall be tested at depth equal to 20 percent of slab thickness).
         2) Place probe to full depth of test hole, place cap over probe.
         3) Permit test site to acclimate, or equilibrate, for 72 hours prior to taking relative humidity readings.
         4) Remove cap and press button on the probe to obtain reading.
         5) Relative humidity readings for substrates receiving non-permeable flooring are 75% or lower.
      d. Testing shall require 3 tests in first 1,000 square feet, with one additional test per each additional 1,000 square feet of concrete slab surface.
      e. Alkalinity Testing: Concrete floors shall be tested for alkalinity prior to installation of flooring. Levels of pH shall not exceed written recommendations of flooring manufacturer or adhesive manufacturer, or both.
      f. Delivery of flooring materials and beginning of installation means acceptance of existing substrate and site conditions.
      g. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
      h. Install Vapor Emission Treatment Systems where tests reveal presence of more than acceptable moisture level in accordance with Test Method ASTM F1869 or ASTM F2170.

C. Proceed with installation after correcting unsatisfactory conditions.

3.3 PREPARATION

A. Comply with CRI 104, Section 7.3 *Site Conditions; Floor Preparation* and with carpet manufacturer's written installation instructions for preparing substrates.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level

cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.

C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet and cushion manufacturer.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

3.4 INSTALLATION

A. Comply with CRI 104 and carpet and carpet cushion manufacturer written installation instructions for the following:
   1. Direct Glue Down Installation: Comply with CRI 104, Section 9 *Direct Glue Down Installation*.
   2. Stair Installation: Comply with CRI 104, Section 13 *Carpet on Stairs* for glue down installation.

B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position:
   1. Do not bridge building expansion joints with carpet.
   2. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.
   3. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

C. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

D. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, *Patterned Carpet Installations* and with carpet manufacturer's written recommendations.

E. Install in accordance with CBC Section 11B-302.2

3.5 CLEANING AND PROTECTING

A. Perform cleaning operations immediately after installing carpet:
   1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
   2. Remove yarns that protrude from carpet surface.
   3. Vacuum carpet using commercial machine with face beater element.

B. Protect installed carpet to comply with CRI 104, Section 16, *Protecting Indoor Installations*.

C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer and carpet cushion manufacturer.

END OF SECTION 09 68 01

SECTION 09 90 00 PAINTING AND COATING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Surface preparation and field painting of exposed items and surfaces.
   2. Field preparation and painting of factory primed metal products and fabrications.
   3. Accessories necessary for a complete installation

1.3 DEFINITIONS

A. Standard coating terms defined in ASTM D16 apply:
   1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
   2. Eggshell refers to low sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
   3. Satin refers to a slightly higher sheen than eggshell and more reflective and durable finish and is less lustrous than semi-gloss.
   4. Semigloss refers to medium sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
   5. Full gloss refers to high sheen finish with a gloss range more than 70 when measured at a 60-degree meter

1.4 SUBMITTALS

A. Product Data:
   1. Submit technical data and information for block fillers, primers, paints, and coatings, including label analysis and instructions for handling, storing, and applying each coating material proposed for use:
      a. Indicate manufacturer's instructions for special surface preparation procedures, substrate conditions requiring special attention.
      b. Material List: Provide inclusive list of required coating materials. Indicate each material and cross reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number, series, and general classification.
      c. Submit Zero VOC compliant products only.

B. Samples:
   1. Submit for each type of paint system and in each color and gloss of topcoat:
      a. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
      b. Provide list of material and application for each coat of each sample. Label each sample as to location and application.
      c. Submit samples on following substrates for review of color and texture only:
         1) Concrete: Provide two 4-inch square samples for each color and finish.
         2) Concrete Masonry: Provide two 4" x 8" samples of masonry, with mortar

joint in the center, for each finish and color.

3) Painted Wood: Provide two 12-inch square samples of each color and material on hardboard.
4) Ferrous and Nonferrous Metals: Provide two 4-inch square samples of flat metal and two 8-inch-long samples of solid metal for each color and finish.

C. Product List: Submit list of including each paint system, color, and location of application. Use same product and location designations indicated in Finish Schedule.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Comply with Federal and local toxicity and air quality regulations and with Federal requirements on content of for heavy metals including but not limited to: lead and mercury. Do not use solvents in paint products that contribute to air pollution.
2. Performance and Durability:
a. ASTM D16 Standard Test Method for Load Testing Refractory Shapes at High Temperatures.
b. ASTM D2486 Standard Test Method for Scrub Resistance of Interior Wall Paint.
c. ASTM D2805 Standard Test Method for Hiding Power of Paints by Reflectometry.
d. ASTM D4828 Standard Test Method for Practical Washability of Organic Coatings.

B. Applicator Qualifications: A firm or individual having minimum 5 years documented experience in applying paints and coatings similar in material, design, and extent to those indicated.

C. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

1.6 WARRANTY

A. Written warranty signed by the manufacturer and the installer in which the manufacture and installer agree to repair or replace paint and primers that fail within specified warranty period:
1. Failures include, but are not limited to, the following:
a. Flaking or delamination of paint with the substrate.
b. Rust, scale, similar imperfections due to improper surface preparation.
c. Thinning or watering of paint beyond that considered acceptable of paint manufacturer.
d. Failure to achieve dry film thickness (DFT) recommended by manufacturer for each coat in a paint system.
e. Deterioration or loss of color of paint beyond normal weathering.
2. Warranty Period: One year from date of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well ventilated areas with ambient temperatures continuously maintained at not less than 45 degrees F (7 degrees C):
1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

PART 2 PRODUCTS

2.1 MATERIALS

A. Subject to compliance with requirements, provide first quality, 100% acrylic, commercial or industrial products of one of the specified manufacturers. Residential products are not permitted:
   1. Proprietary Names:
      a. Paint Schedule is based on a single manufacturer for convenience. Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that named products are required to the exclusion of comparable products of specified manufacturers. Furnish product technical data, including per cent solids by weight and volume; VOC content limits and emissions data; and certificates of performance for comparable paint products of specified manufacturer.
   2. Acceptable Paint Manufacturers:
      a. Sherwin-Williams Co.
      b. Vista Paint.
      c. Benjamin Moore & Co.
      d. Dunn Edwards.
      e. Dulux; Theater Black.

B. Material Compatibility: Provide each paint system including block fillers, primers, and finish coats, that are compatible with one another and with substrates indicated under conditions of service and application, demonstrated by manufacturer based on testing and field experience.

C. Material Quality: Provide manufacturer's best quality commercial paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint material containers not displaying manufacturer's product identification will not be acceptable. Residential quality paint products are not permitted.

D. Chemical Components of Interior Paints and Coatings:
   1. Provide products complying with limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and SCAQMD Rule1113:
      a. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
      b. Restricted Components: Paints and coatings shall not contain components restricted by the EPA and the SCAQMD.

E. Accessories: Materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

F. Patching Materials: Latex filler compatible with paint systems.

G. Fastener Head Cover Materials: Latex filler.

H. Theater Black: No Exceptions or alternates.

2.2 SOURCE QUALITY CONTROL

A. Testing of Paint Materials:
   1. Owner reserves the right to invoke to engage the services of a qualified testing agency to sample paint materials:
      a. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to site, samples may be taken at the site. Samples will be identified, sealed, and certified by testing agency.

b. Testing agency will perform tests for compliance with product requirements.
c. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Apply waterborne paints when temperatures of surfaces to be painted and surrounding air are between 50 degrees F and 90 degrees F (10 degrees and 32 degrees C).

B. Do not thin or add water to water-based paints, including water-based alkyds.

C. Weather Conditions:
1. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
2. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 degrees F (3 degrees C) above dew point; or to damp or wet surfaces.
3. Minimum Application Temperatures for Water based Paints: Between 50 degrees F (10 degrees C) and 90 degrees F (32 degrees C).

D. Apply solvent thinned paints when temperatures of surfaces to be painted and surrounding air are between 45 degrees F. and 95 degrees F (7 degrees F and 35 degrees C):
1. Minimum Application Temperature for Varnish Finishes: 65 degrees F (18 degrees C) for interior or exterior, unless required otherwise by manufacturer's instructions.
2. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

E. Provide lighting level of 80-foot candles (860lx) measured mid-height at substrate surface.

F. Labels: Do not paint over Underwriters Laboratories, Factory Mutual, other code required labels, or equipment name, identification, performance rating, or nomenclature plates.

3.2 EXTRA MATERIALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents:
1. Paint: 2 percent, but not less than 1 gallon (3.8 L) of each material and color applied.

3.3 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for maximum moisture content and conditions affecting performance of the work.

B. Test substrates after repairing and cleaning substrates but prior to application of paint and coatings:
1. Maximum moisture content of substrates, when measured with an electronic moisture meter as follows:

a. Concrete: 12 percent.
b. Fiber Cement Board: 12 percent.
c. Masonry (Clay and CMUs): 12 percent.
d. Wood: 15 percent.
e. Gypsum Board: 12 percent.
f. Plaster: 12 percent.

2. Test cementitious and plaster cement/stucco for alkalinity (pH).

C. Gypsum Board Substrates: Verify taped joints are tapes and finishing compound is sanded smooth.

D. Plaster Substrates: Verify plaster has fully cured. Verify existing plaster is in good condition and can receive new paint coating.

E. Spray Textured Ceiling Substrates: Verify surfaces are dry.

F. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
1. Verify previously painted surfaces can be stripped to bare substrate, repaired if necessary, and prepared to receive new paint system consisting of primer and two top coats at a minimum:
a. Where previously painted surfaces have failed to accept new paint systems. Determined cause of failure and take corrective measures to ensure each surface accepts new paint system. Failure of new paint system is not permitted.

G. Commence paint and coating application after correcting unsatisfactory conditions and surfaces are dry. Application of coating indicates applicator’s acceptance of surfaces and conditions.

3.4 PREPARATION

A. Coordination of Work:
1. Review work in which primers are provided to ensure compatibility of the total system for various substrates. Notify Architect of anticipated problems when using materials specified over substrates primed by others:
a. Preprimed Substrates: Inspect existing conditions in which primers are factory applied to ensure compatibility of the total system for each substrate. Notify Architect of anticipated problems when using the materials specified over factory primed or preprimed substrates.
b. Existing Painted Surfaces: Inspect previously painted surfaces to ensure compatibility of the existing paints with new paint system for each substrate. Notify Architect of anticipated problems.
c. Correct defects and clean surfaces affecting bond with paint system. Remove existing paints exhibiting loose surface defects showing signs of rust, scale, or delamination.
d. Seal marks which may bleed through surface finishes.

B. Surface Preparation:
1. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified. Provide barrier coats over incompatible primers or remove and reprime. If removal is impractical or impossible because of size or weight of item, provide surface applied protection before surface preparation and painting:
a. Remove hardware and hardware accessories, plates, lighting fixtures, and similar items that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface applied protection before surface

preparation and painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
b. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface applied protection if any.
c. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
d. Clean and prepare surfaces to receive paint according to manufacturer's written instructions for each substrate condition and as specified. Provide barrier coats over incompatible primers, existing paint or coating, or remove and reprime.
e. Correct defects and clean surfaces affecting bond with paint or coating system. Remove existing coatings exhibiting loose surface defects. Seal marks which may bleed through surface finishes.

C. Cleaning:
1. Before applying paint or surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning. Schedule cleaning and painting so dust and contaminants from the cleaning process will not fall on wet, newly painted surfaces:
a. Remove incompatible primers, including factory applied primers, and reprime substrate with compatible primers or apply barrier coat as necessary to produce paint systems indicated.
b. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
c. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
d. Galvanized Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
e. Aluminum Substrates: Remove surface oxidation.

D. Mildew and Mold Removal: Remove mildew and mold by high power washing (pressure range of 1500 to 4000 psi) with solution of trisodium phosphate and bleach. If substrate is too soft for high power washing, scrub substrate with solution. Rinse with clean water and allow surface to dry.

E. Protective Coverings: Provide protections for duration of the work, including covering furnishings and decorative items. Protect and mask adjacent finishes and components against damage, marking, overpainting, and injury. Clean and repair or replace damage caused by painting.

F. Renovated Surfaces:
1. Clean surface free of loose dirt and dust. Except at gypsum board surfaces, remove existing paint and coatings to bare substrate and prepare substrates to receive new paint system. Test substrate to verify it will bond with primer and receive new paint system without failure. If test fails, clean surface to base substrate and apply barrier coat. Retest to verify surface will accept new paint system:
a. Remove surface film preventing proper adhesion and bond.
b. Wash glossy paint with a solution of sal soda and rinse thoroughly.
c. Remove loose, blistered, and defective paint and varnish; smooth edges with sandpaper.
d. Clean corroded iron and steel surfaces.
e. Repair and blend into portland cement plaster.
f. Prime bare surfaces.
g. Tone varnished surfaces with stain bringing to uniform color.
h. If existing surfaces cannot be put in acceptable condition for finishing by customary

cleaning, sanding, and puttying operations, notify Owner and do not proceed until correcting unsatisfactory conditions.

G. Cementitious Substrates:
1. Prepare concrete surfaces to receive paint. Remove efflorescence, chalk, dust, dirt, grease, oils, release agents, mold, mildew, and existing paint. Roughen as necessary to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation:
   a. Use abrasive blast cleaning methods if recommended by paint manufacturer.
   b. Do not paint surfaces if moisture content or alkalinity of surfaces exceeds that permitted in manufacturer's written instructions:
      1) Determine alkalinity and moisture content of surfaces by performing appropriate pH testing. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct condition prior to application of paint.
      2) Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m).
      3) Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation after substrates have obtained percent relative humidity level recommended by paint manufacturer.
      4) Perform additional moisture tests when recommended by manufacturer. Proceed with installation when moisture content complies with that permitted in manufacturer's written instructions.
      5) Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water. Allow to thoroughly dry.
   c. Clean concrete floors to receive paint or coating with a 5 percent solution of muriatic acid or etching cleaner. Flush floors with clean water to remove acid; neutralize with ammonia, rinse, allow to dry; vacuum before painting.

H. Ferrous Metals:
1. Clean ungalvanized ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations:
   a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC SP6/NACE No. 3.
   b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
   c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

I. Galvanized Ferrous Metal Substrates: Clean galvanized surfaces with nonpetroleum based solvents leaving surface free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

J. Shop Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC PA1 for touching up shop primed surfaces.

K. Aluminum Substrates: Clean surfaces to remove oil, grease, surface oxidation, and contaminants in accordance with SSPC SP1 Solvent Cleaning. Lightly abrade surface with a nonmetallic pad.

L. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture

content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

M. Plaster/Stucco Substrates:
1. Remove contaminants, release agents, curing compounds, efflorescence, chalk, mold, mildew, and similar deterrents. Spot patch existing plaster to eliminate blisters, buckles, excessive crazing, and to check cracking, dryouts, efflorescence, sweat outs, and similar deflects the prevent plaster from bonding with paint or coatings. Sand or texture repair or patch to match adjacent finish and to remove trowel marks and arises: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
   a. Deep Cracks: Clean out and fill deep cracks with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
   b. Do not paint surfaces if moisture content or alkalinity of surfaces exceeds that permitted in manufacturer's written instructions. Test for alkali using litmus paper.
   c. Allow patching and repair compounds to set and cure before painting.

N. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

O. Wood Substrates:
1. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
2. Sand surfaces that will be exposed to view and dust off.
3. Prime, stain, or seal wood to be painted. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
4. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
5. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

P. Pipe Covering and Insulation: Clean to remove loose, foreign, and objectionable material before applying sealing coat.

Q. Preparation of Substrates for Wallcovering:
1. Prime and seal substrate with release coat in accordance with wallcovering manufacturer's recommendations for substrate:
   a. Assure compatibility with product of wall covering manufacturer.
   b. Fill indentations in substrate and prime with opaque white primer before applying release coat.
   c. Apply release coat in accordance with manufacturer's recommendations.

R. Barrier Coat: Provide barrier coats over incompatible primers or remove and reprime. Notify Owner in writing of anticipated problems using specified finish coat material over previously coated substrates.

S. Material Preparation:
1. Mix and prepare paint materials according to manufacturer's written instructions:
   a. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
   b. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
   c. Do not use thinners for water-based paints.

d. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.5 APPLICATION

A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated:
   1. The term *exposed surfaces* includes areas visible when permanent or built in fixtures, grilles, convector covers, covers for finned tube radiation, and similar components are in place. Extend coatings in these areas to maintain system integrity and provide desired protection.
   2. Use applicators and techniques suited for paint and substrate indicated.
   3. Provide finish coats compatible with primers.
   4. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   5. Paint exposed surfaces (top, bottom, sides, edges, underneath). If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces:
      a. Field painting of exposed surfaces include bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory applied final finish.
      b. Areas visible when permanent or built in fixtures, grilles, convector covers, covers for finned tube radiation, and similar components are in place.
      c. Extend coatings in areas, as required, to maintain system integrity and provide desired protection.
   6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
   7. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
   8. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
   9. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
   10. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or surface imperfections. Cut in sharp lines and color breaks.
   11. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
   12. Provide finish coats compatible with primers used.
   13. Sand lightly between each succeeding enamel or varnish coat.

B. Items not to Receive Paint: Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

C. Applicators:
   1. Apply paints and coatings by brush, roller, spray, or applicators recommended by manufacturer:
      a. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
      b. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool recommended

by manufacturer for material and texture required.

c. Spray Equipment: Use airless spray equipment with orifice size recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness:
1. Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer:
a. Measure film thickness on magnetic surfaces by use of Elcometer thickness gauge and on nonmagnetic surfaces by pit gauge or Tooke Gauge.

E. Application:
1. Apply first coat to surfaces that have been cleaned, pretreated, or prepared for painting as soon as practicable after preparation and before subsequent surface deterioration:
a. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
b. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished after removing rust and scale and priming or touching up surface sand if acceptable to topcoat manufacturers.
c. If undercoats, stains, or conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.
d. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried and cured to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

F. Mechanical and Electrical Work:
1. Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces:
a. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
b. Prime and paint uninsulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, heat exchangers, tanks, ductwork, conduit, switchgear, and paintable insulation except where items are prefinished.
c. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
d. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
e. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows, names, and numbering.
f. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
g. Concealed Members: Wherever steel and metal parts to receive paint are built into and concealed by construction, paint as specified for exposed parts so finish painting is complete before members are concealed.

G. Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Painting is limited to items exposed in equipment rooms and occupied spaces:

a. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
b. Prime and paint uninsulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, heat exchangers, tanks, ductwork, conduit, switchgear, and paintable insulation except where items are prefinished.
c. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
d. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
e. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows, names, and numbering.
f. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

H. Block Fillers: Apply block fillers to concrete masonry block at rate to ensure complete coverage with pores filled.

I. Prime Coats: Before applying finish coats, apply prime coat, recommended by manufacturer, to material required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or defects due to insufficient sealing.

J. Finish Coats:
1. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance without bleed through:
   a. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or surface imperfections is not acceptable.
   b. Transparent (Clear) Finishes: Use multiple coats to produce glass smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats.

K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

L. Touch Up:
1. Touch up marred, scraped, and blemished areas of surfaces which were factory primed or previously coated:
   a. Prepare and touch up scratches, abrasions, and blemishes and remove foreign matter before proceeding with succeeding coats.
   b. Touch up marred, scraped, and blemished areas of factory primed or previously coated surfaces.
   c. Feather touch up coating overlapping minimum 2 inches onto adjacent unblemished areas producing smooth, uniform surface.
   d. As soon after erection and installation as possible, touch up fasteners, welded surfaces and surroundings, field connections, and areas on which shop coat has

been abraded or damaged with specified primer before corrosion and other damage occurs from exposure.

3.6 FIELD QUALITY CONTROL

A. Dry Film Thickness (DFT) Testing:
   1. Tests for dry film thickness may be determined by using a Tooke Scale and microgroover, an electronic scanner, or the Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness:
      a. Contractor shall touch up and restore painted surfaces damaged by testing.
      b. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.7 CLEANING AND PROTECTION

A. It is of the upmost important to the AISD that the sites remain in a safe, clean, and well-maintained condition. At the end of each day, leave the site ready to use by staff and students. Protect staff and students and the learning environment throughout the work.

B. Cleanup: At the end of each day, remove empty cans, rags, rubbish, and discarded paint materials from site. After completion of painting work, clean glass and paint spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. Provide *Wet Paint* signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work. After related work is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

E. At completion of painting activities, touch up and restore damaged or defaced painted surfaces.

F. Waste Management: Legally dispose of unused paint and paint containers in accordance with manufacturer’s recommendations and environmental regulations.

PART 4 SCHEDULES

A. The following is a schedule of typical painted items and does not specifically include every item that is to receive paint but should establish type and quality of finish for all items normally included in a complete paint job.

B. Exterior Surfaces (Note: Exterior surfaces are divided into two (2) different categories, based upon color and level of graffiti resistance required. System 1 will be used when standard earthtone colors or neutral colors are specified, and System 2 will be used when bright colors [primary reds, yellows, and oranges] are specified and/or when a graffiti resistant coating is required):
   1. Galvanized Metal:
      a. Surface Preparation: Acid etch galvanized surfaces that have not weathered at least six (6) months prior to beginning painting operations. Krud Kutter Metal Clean

and Etch.
b. Primer: One (1) coat Ultrashield ULDM00 DTM Gray Primer.
c. Finish: Two (2) coats Ultrashield ULSH40 Low Sheen High Performance Acrylic Urethane.
d. Finish: Two (2) coats US Coatings RustGrip 2300 1-2 Mils DFT.

2. Un-galvanized Metal:
   a. Primer: One (1) coat Ultrashield ULDM00 DTM Gray Primer.
   b. Finish: Two (2) coats Ultrashield ULSH40 Low Sheen High Performance Acrylic Urethane.
3. Concrete and CMU:
   a. Primer/Finish: (2) coats Eff-Stop Premium ESPR00 Masonry Primer / (2) coats US Coatings AquaGrip 2600 3-5 Mils DFT.
4. Wood (Includes plywood siding and wooden trim):
   a. Primer: One (1) coat EZ-Prime EZPR00 Exterior Wood Primer.
   b. Finish: Two (2) coats Spartashield SSHL60 100% Acrylic Gloss.
5. Fiber-Cement Materials:
   a. Primer: One (1) coat Eff-Stop Premium ESPR00 Masonry Primer.
   b. Finish: Spartashield SSHL60 100% Acrylic Gloss.
6. Parking Line and Driveway Paint: Vin-L-Stripe VSZM10 Zone Marking Paint Yellow.
7. All piping in mechanical rooms shall be painted in their entirety, in the following colors: Aristoshield ASHL70 High-Gloss Enamel:
   a. Gas lines: Orange
   b. Domestic cold water: White
   c. Domestic hot water: Pink
   d. Heating hot water: Red
   e. Condenser water: Green
   f. Chilled water: Blue

C. Interior Surfaces:
1. Galvanized Metal:
   a. Primer: One (1) coat Ultrashield Galvanized Metal Primer ULGM00.
   b. Finish: Two (2) coats Aristoshield ASHL50 Semi-Gloss Enamel.
2. Shop-Primed Ferrous Metals (Use for metal doors and frames and miscellaneous metal items):
   a. Shop coat by others.
   b. One (1) coat over Steel: Bloc-Rust Premium BRPR00 Rust Preventative Primer; Aluminum: Ultrashield Galvanized Metal Primer ULGM00.
   c. Two (2) coats Aristoshield ASHL50 Semi-Gloss Enamel.
3. Gypsum Wallboard:
   a. Primer: One (1) coat Vinylastic Premium VNPR00 Acrylic Wall Sealer.
   b. Finish: Two (2) coats Spartawall Premium SWLL30 Acrylic Latex Eggshell.
4. Primer Concrete and CMU (Enamel):
   a. One (1) coat Smooth Blocfil Premium SBPR00 100% Acrylic Block Filler.
   b. Finish: Two (2) coats Premium SWLL50 Acrylic Latex Semi-Gloss.
5. Wood (Painted):
   a. Primer: Interkote Premium IKPR00 100% Acrylic Enamel Undercoater.
   b. Finish: Aristoshield ASHL50 Semi-Gloss Enamel.
6. Wood (Stained):
   a. Stain: Gemini Craftsman Collection Wiping Stain CCW Water-Based Series.
   b. Finish (First Coat): WB-0230 Gemini Titanium Clear Urethane Satin
   c. Finish (Second Coat): Gemini WB-0230 Gemini Titanium Clear Urethane Satin.
7. Gypsum Wallboard (Epoxy) – Kitchens, bathrooms, laboratories, etc.:
   a. Primer: One (1) coat US Coatings AquaGrip 2600 2-3 Mils DFT.
   b. Finish: Two (2) coats US Coatings AquaGrip 2600 3-5 Mils DFT per coat.
8. CMU (Epoxy) - Kitchens, bathrooms, laboratories, etc.:
   a. Primer: Two (2) coats Smooth Blocfil Premium SBPR00 100% Acrylic Block Filler.

b. Finish: Two (2) coats US Coatings AquaGrip 2600 3-5 Mils DFT.

9. Pipe and fittings, including but not limited to copper and brass, at kitchen areas (but excluding aluminum, stainless steel, nickel and chrome plated pipe and fittings):
   a. Primer: One (1) coat; US Coatings RustGrip 2300 1-2 Mils DFT.
   b. Finish: Two (2) coats bright aluminum paint, US Coatings UreGrip 3000 VOC 2-3 Mils DFT per coat.

D. Paint Types: Refer to the Finish Schedule in the Drawings.

END OF SECTION 09 90 00

SECTION 10 11 00 MARKERBOARD AND TACKBOARD

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
1. Visual display board assemblies.
2. Floor to ceiling visual display assemblies.
3. Rail support systems for visual display board assemblies.
4. Modular support systems for visual display board assemblies.
5. Sliding visual display units.
6. Visual display conference units.
7. Natural slate chalkboards.
8. Glass markerboards.
9. Display rails.
10. Accessories necessary for a complete installation.

B. Related Sections:
1. Section 03 30 00: Cast-In-Place Concrete.
2. Section 06 10 00: Rough Carpentry.
3. Section 09 21 16: Gypsum Board Assemblies.
4. Section 09 90 00: Painting and Coating.

1.3 SUBMITTALS

A. Product Data:
1. Technical data for each type of product including construction details, material descriptions, dimensions of individual components and profiles, finishes, and accessories for visual display units:
a. Include electrical characteristics for motorized units.

B. Shop Drawings:
1. Submit plans, elevations, sections, details, and attachment to other work:
a. Indicate sizes and layout, method of attachment, accessories, trim, details and finish.
b. Show locations of panel joints. Show locations of field assembled joints for factory fabricated units too large to ship in one piece.
c. Show locations and layout of special purpose graphics.
d. Include sections of typical trim members.
e. Include wiring diagrams for power and control wiring.

C. Samples:
1. Submit for each type of visual display unit indicated:
a. Visual Display Panel: Not less than 8-1/2 inches by 11 inches (215 mm by 280 mm), with facing, core, and backing indicated for final work. Include one panel for each type, color, and texture required.
b. Trim: 6 inch (150 mm) long sections of each trim profile.
c. Display Rail: 6 inch (150 mm) long section of each type.

d. Modular Support System: 6 inch (152 mm) long sections.
e. Accessories: Full size Sample of each type of accessory.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for surface burning characteristics of tackboards.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Surface Burning Characteristics:
a. Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency:
1) Flame Spread Index: 25 or less.
2) Smoke Developed Index: 450 or less.
2. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Accessibility Requirements:
a. Comply with applicable requirements:
1) Americans with Disabilities Act of 1990, as amended:
a) ADA Title II Regulations & the 2010 ADA Standards for Accessible Design.
2) 2022 California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA):
a) CBC Chapter 11B, Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.

B. Installer Qualifications: Entity having minimum 5 years documented experience that employs installers and supervisors who are trained and approved by manufacturer.

C. Source Limitations: Obtain each type of visual display unit from single source from single manufacturer.

D. Mockups:
1. Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and installation:
a. Build mockup of typical wall area or visual display unit and floor to ceiling visual display assembly as shown on Drawings. Include accessories and temporary power.
b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
c. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Pre-installation Conference: Conduct conference at site.

1.5 WARRANTY

A. Porcelain Enamel Face Sheets:
1. Written warranty in which Manufacturer agrees to repair or replace porcelain enamel face sheets that fail in materials or workmanship within specified warranty period:
a. Failures include, but are not limited to, the following:
1) Surfaces lose original writing and erasing qualities.
2) Surfaces exhibit crazing, cracking, or flaking.

3) Noticeable deterioration of finish.
4) Writing surface delamination.
5) Fabric discoloration, tearing, or delamination.
6) Unit releasing from substrate.

2. Warranty Period: 5 years from date of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Platinum Visual Solutions

B. NACO.

C. Equivalent manufacturers on approval.

2.2 MATERIALS

A. Porcelain Enamel Face Sheet: PEI-1002, with face sheet two or three coat process.

B. High Pressure Plastic Laminate: NEMA LD 3.

C. Natural Cork Sheet: Seamless, single layer, compressed fine grain cork sheet; bulletin board quality; face sanded for natural finish with surface burning characteristics indicated.

D. Plastic Impregnated-Cork Sheet: Seamless, homogeneous, self-sealing sheet consisting of granulated cork, linseed oil, resin binders, and dry pigments that are mixed and calendared onto fabric backing; with washable vinyl finish and integral color throughout with surface-burning characteristics indicated.

E. Vinyl Fabric: Mildew resistant, washable, complying with FS CCC-W-408D, Type II, burlap weave; weighing not less than 13 oz./sq. yd. (440 g/sq. m); with surface burning characteristics indicated.

F. Polyester Fabric: Nondirectional weave, 100 percent polyester; weighing not less than 15 oz./sq. yd. (508 g/sq. m); with surface-burning characteristics indicated.

G. Hardboard: ANSI A135.4, tempered.

H. Particleboard: ANSI A208.1, Grade M-1.

I. Medium Density Fiberboard: ANSI A208.2, Grade 130.

J. Fiberboard: ASTM C208 cellulosic fiber insulating board.

K. Clear Tempered Glass: ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality Q3, with exposed edges seamed before tempering.

L. Extruded Aluminum: ASTM B221, Alloy 6063.

M. Adhesives for Field Application: Mildew-resistant, nonstaining adhesive for use with specific type of panels, sheets, or assemblies; and for substrate application; as recommended in writing by visual display unit manufacturer.

N. Primer/Sealer: Mildew resistant primer/sealer recommended in writing by visual display unit manufacturer for intended substrate.

2.3 VISUAL DISPLAY BOARD ASSEMBLY

A. Manufacturers:
1. Subject to compliance with requirements, provide products by one of the following:
   a. ABC School Equipment, Inc.
   b. ADP.
   c. AJW Architectural Products.
   d. Architectural School Products Ltd.
   e. Best-Rite; MooreCo, Inc.
   f. Claridge Products and Equipment, Inc.
   g. Egan Visual Inc.
   h. EverWhite.
   i. Ghent Manufacturing, Inc.
   j. Marsh Industries, Inc.
   k. Nelson Adams, Inc.
   l. Peter Pepper Products, Inc.
   m. Platinum Visual Solution Systems.
   n. Promethean World
   o. Comparable product.

B. Visual Display Board Assembly:
1. Field or factory fabricated:
   a. Assembly: Chalkboard, markerboard, and tackboard.
   b. Corners: Square.
   c. Width: Indicated on Drawings.
   d. Height: Indicated on Drawings.
   e. Mounting Method: Direct to wall or Modular support system.

C. Chalkboard Panel:
1. High pressure laminate faced chalkboard panel on core indicated:
   a. Color: Selected by Architect.

D. Markerboard Panel:
1. Single:
   a. High pressure laminate faced markerboard panel on core indicated:
      1) Color: White
2. Slider 3- panel and 4 – panel:
   a. High pressure laminated faced markboards on sliders.
   b. Color and Pattern: Selected by Architect.

E. Tackboard Panel:
1. Vinyl fabric faced tackboard panel on core indicated:
   a. Fabric Wrapped Edge: Wrap edge of tackboard panel with fabric facing.
   b. Color and Pattern: Selected by Architect.

F. Aluminum Frames:

1. Fabricated from not less than 0.062 inch (1.57 mm) thick, extruded aluminum; slim size and standard shape of size and shape indicated on Drawings:
   a. Field Applied Trim: Snap on trim with no visible screws or exposed joints
   b. Aluminum Finish: Clear anodic finish.
   c. Color and Pattern: Selected by Architect.

G. Factory Applied Wood Trim: Red oak not less than 1/2 inch (13 mm) thick; standard size and shape with transparent finish.

H. Vinyl Trim: Selected by Architect.

I. Joints: Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board as indicated on approved Shop Drawings.

J. Combination Assemblies: Provide hidden spline between abutting sections of visual display panels.

K. Chalktray:
   1. Continuous:
      a. Box Type: Extruded aluminum with slanted front, grooved tray, and cast aluminum end closures.
      b. Solid Type: Extruded aluminum with ribbed section and smoothly curved exposed ends.

L. Display Rail:
   1. Extruded aluminum display rail with plastic impregnated cork insert, end stops, and continuous paper holder, designed to hold accessories:
      a. Size: 2 inches (50 mm) high by length indicated on Drawings.
      b. Map Hooks: Two map hooks for every 48 inches (1200 mm) of display rail or fraction thereof.
      c. Map Hooks and Clips: Two map hooks with flexible metal clips for every 48 inches (1200 mm) of display rail or fraction thereof.
      d. Flag Holder: One for each room.
      e. Tackboard Insert Color: Selected by Architect.
      f. Aluminum Color: Match finish of visual display assembly trim.

M. Paper Holder Display Rail: Extruded aluminum; designed to hold paper by clamping action.

N. Special Purpose Graphics: Fuse or paint semivisible writing guidelines, penmanship lines, music staff lines, grid, 1 inch (25 mm) square, rectangular graph coordinates, [polar graph coordinates] [horizontal lines, 2 inches (50 mm) o.c., graphic onto surface of porcelain enamel visual display unit. Exact location to be determined by District.

2.4 VISUAL DISPLAY ASSEMBLIES

A. Manufacturers:
   1. Subject to compliance with requirements, provide products by one of the following:
      a. AJW Architectural Products.
      b. Claridge Products and Equipment, Inc.
      c. Egan Visual Inc.
      d. Platinum Visual Systems.

B. Markerboard Panel Assemblies:
   1. Consisting of markerboard panels with high pressure laminate facing on core indicated,

fabricated for floor-to-ceiling assemblies:
a. Color: Selected by Architect.

C. Tackboard Panel Assemblies:
1. Consisting of tackboard panels with vinyl fabric or polyester fabric facing on core indicated, fabricated for floor to ceiling assemblies:
a. Edge Treatments:
1) Panel Joint Edges: Wrapped with fabric.
2) Top of Wall Edges: Wrapped with fabric.
3) Bottom of Wall Edges: Wrapped with fabric.
4) Corners: Wrapped with fabric.
b. Color: Selected by Architect.

D. Width: As indicated on Drawings.

E. Height: As indicated on Drawings.

F. Joint Accessories: Unless otherwise indicated concealed aluminum or steel spline at butt joints.

2.5 MODULAR SUPPORT SYSTEM FOR VISUAL DISPLAY BOARD ASSEMBLIES

A. Manufacturers:
1. Subject to compliance with requirements, provide products by one of the following:
a. AARCO Products, Inc.
b. Architectural School Products Ltd.
c. Claridge Products and Equipment, Inc.
d. Platinum Visual Systems.

B. Standards:
1. 72 inch (1829 mm) long extruded aluminum slotted standards designed for supporting visual display boards on panel clips. Space slots at not less than 4 inches (100 mm) o.c.:
a. Finish and color: As selected by Architect.

C. Panel Clips: Extruded aluminum or steel with finish to match standards.

2.6 VISUAL DISPLAY CONFERENCE UNITS

A. Manufacturers:
1. Subject to compliance with requirements, provide products by one of the following:
a. A-1 Visual Systems.
b. AARCO Products, Inc.
c. Architectural School Products Ltd.
d. Best-Rite; MooreCo, Inc.
e. Claridge Products and Equipment, Inc.
f. Egan Visual Inc.
g. Ghent Manufacturing, Inc.
h. Marsh Industries, Inc.
i. Peter Pepper Products, Inc.
j. Platinum Visual Systems.

B. Visual Display Conference Units:
1. Factory fabricated units consisting of hinged door wood cabinet with perimeter face frame, sides, and back; not less than 3 inch (75 mm) interior depth and designed for

surface wall mounting. Fabricate inside of cabinet and cabinet doors with fixed visual display units:

a. Wood Cabinets - Fabricated from solid wood with integral, solid wood marker tray. Fabricate hinged door panels with solid wood frame and wood veneer exterior surface:
   1) Species and Finish: Red oak with natural lacquered finish.
b. Plastic Laminate Cabinets - Cabinet and hinged door panels fabricated from high pressure, plastic laminate finished wood panels; with integral marker tray:
   1) Color: Selected by Architect.
c. Hardware - Full height continuous hinges, wire door pulls, and door bumpers.
d. Fixed Rear Panel - High pressure laminate markerboard panel:
   1) Color: Selected by Architect.
e. Inside Surface of Doors - Same as fixed rear panel.
f. Inside Surface of Doors - Tackboard panel consisting of polyester fabric facing on core:
   1) Color: Selected by Architect.
g. Projection Screen - Pull down, matte, white projection screen, not less than 8 inches (200 mm) smaller in each direction than overall cabinet size, and mounted above rear visual display panel.
h. Fluorescent Light - Minimum 24 inches (610 mm) long, and mounted above rear visual display panel.
i. Width - As indicated on Drawings.
j. Height - As indicated on Drawings.
k. Accessories - Cylinder lock and flip chart pad clamp.

2.7 FINISH REQUIREMENTS

A. Comply with NAAMM *Metal Finishes Manual for Architectural and Metal Products* for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Aluminum Finishes:
   1. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.
   2. Color Anodic Finish: AAMA 611, AA-M12C22A32/A34, Class II, 0.010 mm or thicker.
   3. Baked Enamel or Powder Coat Finish: AAMA 2603, except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Field Measurements:
   1. Verify actual dimensions of construction contiguous with visual display units by field

measurements before fabrication:

a. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

3.2 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the work.

B. Examine roughing in for electrical power systems to verify actual locations of connections before installation of motorized, sliding visual display units.

C. Examine walls and partitions for proper preparation and backing for visual display units.

D. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.

E. Proceed with installation after correcting unsatisfactory conditions.

3.3 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation. Clean substrates of substances, such as dirt, mold, and mildew, that impair the performance of and affect the smooth, finished surfaces of visual display boards.

B. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display units and wall surfaces:

1. Moisture Content: Maximum of 4 percent when tested with an electronic moisture meter.
2. Prepare substrates indicated to receive glass writing surfaces required by manufacturer's written instructions to achieve a smooth, dry, clean, structurally sound surface that is uniform in color:
   a. Gypsum Board: Prime gypsum board with primer as recommended in writing by primer/sealer manufacturer and glass writing surface manufacturer.
   b. Painted Surfaces: Treat areas susceptible to pigment bleeding.

C. Prime wall surfaces indicated to receive visual display units, direct applied floor to ceiling visual display assemblies and as recommended in writing by primer/sealer manufacturer and visual display unit manufacturer.

D. Prepare recesses for sliding visual display units as required by type and size of unit.

3.4 INSTALLATION

A. Install visual display surfaces in locations and at mounting heights indicated on Drawings. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

B. Field Assembled Visual Display Board Assemblies:

1. Coordinate field assembled units with grounds, trim, and accessories indicated. Join parts with a neat, precision fit:
   a. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as

acceptable to Architect.
b. Where size of visual display board assemblies or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.
c. Field Applied Aluminum Trim: Attach trim over edges of visual display boards and conceal grounds and clips. Attach trim to boards with fasteners at maximum 24 inches (610 mm) o.c.

C. Factory Fabricated Visual Display Board Assemblies:
1. Adhere to wall surfaces with egg size adhesive gobs at 16 inches (400 mm) o.c., horizontally and vertically:
a. Field Applied Aluminum Trim - Attach trim over edges of visual display boards and conceal grounds and clips. Attach trim to boards with fasteners at maximum 24 inches (610 mm) o.c.
b. Mounting - Height Install visual display units at mounting heights indicated on Drawings, or if not indicated, at heights indicated:
1) Mounting Height for Grades K through 3: 24 inches (610 mm) above finished floor to top of chalktray.
2) Mounting Height for Grades 4 through 6: 28 inches (711 mm) above finished floor to top of chalktray.
3) Mounting Height for Grades 7 and Higher: 36 inches (914 mm) above finished floor to top of chalktray.

D. Factory Fabricated Visual Display Board Assemblies:
1. Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches (400 mm) o.c. Secure tops and bottoms of boards to walls:
a. Field Applied Aluminum Trim - Attach trim over edges of visual display boards and conceal grounds and clips. Attach trim to boards with fasteners at maximum 24 inches (610 mm) o.c.
b. Mounting Height - Install visual display units at mounting heights indicated on Drawings, or if not indicated, at heights indicated:
1) Mounting Height for Grades K through 3: 24 inches (610 mm) above finished floor to top of chalktray.
2) Mounting Height for Grades 4 through 6: 28 inches (711 mm) above finished floor to top of chalktray.
3) Mounting Height for Grades 7 and Higher: 36 inches (914 mm) above finished floor to top of chalktray.

E. Natural Slate Chalkboards:
1. Align and level joints between adjoining panels, and apply manufacturer's recommended joint filler compound. Hone and finish joints to continuous even plane:
a. Field Applied Aluminum Trim - Attach trim over edges of visual display boards and conceal grounds and clips. Attach trim to boards with fasteners at maximum 24 inches (610 mm) o.c.
b. Mounting Height - Install visual display units at mounting heights indicated on Drawings, or if not indicated, at heights indicated:
1) Mounting Height for Grades K through 3: 24 inches (610 mm) above finished floor to top of chalktray.
2) Mounting Height for Grades 4 through 6: 28 inches (711 mm) above finished floor to top of chalktray.
3) Mounting Height for Grades 7 and Higher: 36 inches (914 mm) above finished floor to top of chalktray.

F. Display Rails:

1. Install rails at mounting heights indicated on Drawings, or if not indicated, at height indicated below. Attach to wall surface with fasteners at not more than 16 inches (400 mm) o.c.:
   a. Mounting Height: 72 inches (1829 mm) above finished floor to top of rail.

G. Floor to Ceiling Markerboard Panels:
1. Attach panels to wall surface with egg size adhesive gobs at 16 inches (400 mm) o.c., horizontally and vertically:
   a. Join adjacent panels with concealed steel splines for smooth alignment.
   b. Join adjacent panels with exposed, H shaped aluminum trim painted to match wall panel.

H. Floor to Ceiling Tackboard Panels:
1. Attach panels to wall surface with egg size adhesive gobs at 16 inches (400 mm) o.c., horizontally and vertically:
   a. Install wrapped edge panels with butt joints between adjacent wall panels.
   b. Join adjacent panels with exposed, H shaped aluminum trim covered with same fabric as wall panels.

I. Rail Support System:
1. Install horizontal support rail at mounting heights indicated on Drawings. Attach to wall with fasteners at 12 inches (300 mm) o.c.:
   a. Mounting Height: 72 inches (1829 mm) above finished floor to top of rail.
   b. Hang visual display units on rail support system.

J. Modular Support System:
1. Install adjustable standards at mounting heights indicated on Drawings. Install standards at 48 inches (1200 mm) o.c., vertically aligned and plumb, and attached to wall with fasteners at 12 inches (300 mm) o.c.:
   a. Mounting Height: 12 inches (305 mm) above finished floor to bottom of standard.
   b. Install single slotted standard at each end of each run of standards and double slotted standards at intermediate locations.
   c. Provide locking screw at top corner of visual display board at each standard.
   d. Hang visual display units on modular support system.

K. Sliding Visual Display Units:
1. Install units at mounting heights indicated. Attach to wall framing with fasteners at not more than 16 inches (400 mm) o.c.:
   a. Adjust panels to operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

L. Visual Display Conference Units:
1. Install units at mounting heights indicated on Drawings. Attach to wall surface with concealed brackets screwed to wall:
   a. Mounting Height: 72 inches (1829 mm) above finished floor to top of cabinet.

3.5 CLEANING AND PROTECTION

A. Clean visual display units according to manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.

B. Touch up factory applied finishes to restore damaged or soiled areas.

C. Cover and protect visual display units after installation and cleaning.

END OF SECTION 10 11 00

SECTION 10 14 00 GRAPHICS AND SIGNAGE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Room identification signs.
   2. Restroom signs.
   3. Misc. identification signs.
   4. Informational signs (not identification signs).
   5. Accessories necessary for a complete installation.
   6. Mascot Logo.

B. Related Sections:
   1. Section 06 10 00: Rough Carpentry.
   2. Section 09 21 16: Gypsum Board Assemblies.

1.3 SUBMITTALS

A. Product Data: Technical data for each type of signage.

B. Shop Drawings:
   1. Submit fabrication and installation details and attachments to other work:
      a. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
      b. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
      c. Exterior applied signage on face of wall to include mounting brackets and support anchorage to fit condition.

C. Samples: Submit one sample of each specified sign type, full-sized.

1.4 QUALITY ASSURANCE

A. Field Inspections:
   1. All new tactile signage must be field inspected after installation per CBC 11B-703.1.1.2.

B. Accessibility Requirements:
   1. Raised characters shall comply with CBC Section 11B-302.2.
      a. Depth: It shall be 1/32-inch (0.8 mm) minimum above their background, shall be sans serif uppercase, and be duplicated in Braille.
      b. Height: It shall be 5/8-inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter “I.” See CBC Section 11B-703.2.5.
      c. Finish and Contrast: Characters and their background shall have a non-glare finish. Character shall contrast with their background with either light characters on a dark background or dark characters on a light background. See CBC Section11B-703.5.1.

d. Proportions: It shall be selected from fonts where the width of the uppercase letter "O" is 60% minimum and 110% maximum of the height of the uppercase letter "I." Stroke thickness of the uppercase letter "I" shall be 15% maximum of the height of the character. See CBC Sections 11B-703.22.4 and 11B-703.2.8.
e. Character Spacing: Spacing between individual raised characters shall comply with CBC Section 11B-703.2.7 and 11B-703.2.8.
f. Format: Text shall be in a horizontal format. See CBC Section 11B-703.2.9.
g. Braille: It shall be contracted (Grade 2) and shall comply with CBC Sections 11B-703.3 and 11B-703.4. Braille dots shall have a domed or rounded shape and shall comply with CBC Table and Figure 11B-703.3.1.
h. Mounting Height: Tactile characters on signs shall be located 48 inches minimum to the baseline of the lowest Braille cells and 60 inches maximum to the baseline of the highest line of raised characters above the finish floor or ground surface. See CBC Section and Figure 11B-703.4.4.
i. Mounting Location:
    1) A tactile sign shall be located per CBC Section and Figure 11B-703.4.2 as follows:
        a) Alongside a single door at the latch side.
        b) On the inactive leaf at double doors with one active leaf.
        c) To the right of the right-hand door at double doors with two active leafs.
        d) On the nearest adjacent wall where there is no wall space at the latch side of a single door or at the right side of double doors with two active leafs.
        e) So that a clear floor space of 18 inches x 18 inches minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45-degree open position.
j. Visual Characters: Shall comply with CBC Section 11B-703.5 and shall be 40 inches minimum above finish floor or ground.
k. Pictograms: Shall comply with CBC Section 11B-703.6.
l. Symbols of Accessibility: Shall comply with CBC Section 11B-703.7.
m. Variable Message Signs: Shall comply with CBC Section 11B-703.8.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers:
1. Subject to compliance with requirements, provide products by one of the following:
    a. Apco Signs
    b. ASI Modulex, Inc.
    c. Best Sign Systems, Inc.
    d. InPro Corporation (IPC).
    e. Mohawk Sign Systems.
    f. Nelson-Harkins Industries.
    g. Seton Identification Products.
    h. Stamprite Supersine; a division of Stamp Rite Inc.
    i. Vomar Products, Inc.

B. Aluminum Castings: ASTM B26/B26M, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated. Refer to drawings for location.

C. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated. Refer to drawings for location.

D. Aluminum Extrusions: ASTM B221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

E. Acrylic Sheet: ASTM D4802, category standard with manufacturer for each sign, Type UVF (UV filtering).

F. Plastic Laminate Sheet: NEMA LD 3, general purpose HGS grade, 0.048-inch (1.2-mm) nominal thickness.

G. Vinyl Film: UV resistant vinyl film of nominal thickness indicated, with pressure sensitive, permanent adhesive on back; die cut to form characters or images indicated and suitable for exterior applications.

H. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

I. Accessories:
1. Fasteners and Anchors:
   a. As necessary for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:
      1) Use concealed fasteners and anchors unless indicated to be exposed.
      2) Exposed Metal Fastener Components: Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
2. Sign Mounting Fasteners:
   a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
3. Adhesive: Recommended by sign manufacturer.
4. Two Face Tape: High bond, foam core tape, 0.045 inch (1.14 mm) thick, with adhesive on both sides.
5. Bituminous Paint: Cold applied asphalt emulsion complying with ASTM D1187.

2.2 SIGNAGE

A. Laminated Plastic Tactile Room, Restroom and Miscellaneous Identification Signs:
1. Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
   a. Laminated Sheet Sign:
      1) Photopolymer face sheet with raised graphics laminated over subsurface graphics to acrylic backing sheet to produce composite sheet:
         a) Color(s): Selected by Architect from manufacture’s full range of standard colors.
   b. Sign Panel Perimeter:
      1) Finish edges smooth:
         a) Edge Condition: Beveled.
         b) Corner Condition in Elevation: Square.
   c. Mounting at Walls: Stainless steel vandal-proof pin-in-head torx screws Surface mounted to wall with concealed anchors.
   d. Mounting at Glazing: Clear silicone adhesive.
   e. Text and Typeface, Panel and Photo Polymer Signs:
      1) Accessible raised characters and Braille. Finish raised characters to contrast with background color, and finish Braille to match background color:
         a) Raised Characters: Refer to Drawings.
         b) California Contracted Grade 2 Braille: Refer to Drawings.
         c) Pictograms: Field height of minimum 6 inches; no characters or braille in pictogram field; nonglare, field contrast to pictogram, text descriptors

below pictogram field
d) Accessibility Symbols: Where used, symbols shall comply with CBC 11B-703.7.

B. Solid Plastic Tactile Room, Restroom and Miscellaneous Identification Signs:
1. 1/4-inch thick, Graphic Process Sand Carved with pre-drilled holes for mounting screws:
a. Sign Panel Perimeter:
1) Edge Condition: Square cut.
2) Corner Condition in Elevation: 3/8” radius.
b. Mounting at Walls: Stainless steel vandal-proof pin-in-head torx screws
c. Mounting at Glazing: Clear silicone adhesive
d. Text and Typeface:
1) Accessible raised characters and Braille. Finish raised characters to contrast with background color, and finish Braille to match background color:
a) Raised Characters: Refer to drawings
b) California Contracted Grade 2 Braille: Refer to drawings
c) Pictograms: Field height of minimum 6 inches; no characters or braille in pictogram field; nonglare, field contrast to pictogram, text descriptors below pictogram field
d) Accessibility Symbols: Where used, symbols shall comply with CBC 11B-703.7.
e. Color: As selected by Architect from manufacture’s full range of standard colors.
f. For exterior uses, fabricate signs from exterior grade materials with UV inhibitor.

C. Cast Characters:
1. Characters with uniform faces, sharp corners, and precisely formed lines and profiles:
a. Character Material: Cast aluminum.
b. Character Height: Indicated on Drawings.
c. Finishes:
1) Baked Enamel or Powder Coat Finish: Color to be selected by the Architect from manufacture’s full range of standard colors.
2) Overcoat: Baked on clear coating.
d. Mounting: Concealed studs.
e. Typeface: Selected by Architect.

D. Field Applied, Vinyl Character Sign:
1. Prespaced characters die cut from 3 mil to 3.5 mil (0.076 mm to 0.089 mm) thick, weather resistant vinyl film with release liner on the back and carrier film on the front for onsite alignment and application:
a. Manufacturers:
1) Subject to compliance with requirements, provide products by one of the following:
a) Allen Markings.
b) APCO Graphics, Inc.
c) Mohawk Sign Systems.
d) Seton Identification Products.
2) Size: Indicated on Drawings.
3) Substrate: Indicated on Drawings.

E. Exterior Directional Signage: 0.080 inch thick aluminum sheet sign of size indicated. Paint with reflectorized paint. Graphics and text to be as indicated. Mount sign to wall with four countersunk vandal resistant screws or on free standing 2-inch diameter standard weight galvanized steel pipe post as indicated. Signs shall be in conformance with CBC, California Building Code (CCR), Title 24, Part 2, Section 11B-216.9.2 and 11B-703.5.

F. Accessible Gate Signage: 0.080 inch thick aluminum sheet sign of size indicated. Paint with reflectorized paint. Graphics and text to be as indicated. Attach sign to adjacent fence with 12 gage wire ties at each corner. Mount sign at 5'-0" from grade to center of sign. Sign shall be in conformance with CBC, California Building Code (CCR), Title 24, Part 2, Section 11B-206.4.7 and 11B-404.1.1.

G. Traffic Signage:
1. Van Parking Stall: 12 inch x 18 inch 0.080 inch thick aluminum accessible sign in accordance with CBC, California Building Code, (CCR), Title 24, Part 2, Section 11B-502.6 and 11B-703.7.2.1 with separate 12 inch wide x 4 inch high sign with "Van-Accessible" wording and additional language below symbol of accessibility that states "Minimum Fine $250.00." Mount on 2 inch diameter standard weight galvanized steel pipe post. Auto Parking Stall: 12 inch x 18 inch 0.080 inch thick aluminum accessible sign in accordance with CBC, California Building Code, (CCR), Title 24, Part 2, Section 11B-502.6 and 11B-703.7.2.1 with additional language below symbol of accessibility that states "Minimum Fine $250.00." Mount on 2 inch diameter standard weight galvanized steel pipe post
2. Drive Approach: 18 inch x 24 inch 0.080 inch thick aluminum tow- away sign with local address and police phone number in accordance with CBC, California Building Code, (CCR), Title 24, Part 2, Section 11B-502.8.1. Mount on 2 inch diameter standard weight galvanized steel pipe post.
3. Passenger Loading Zone: 12 inch x 18 inch 0.080 inch thick aluminum sign as detailed on drawings. Mount on 2 inch diameter standard weight galvanized steel pipe post.

2.3 FABRICATION

A. Provide sign assemblies according to requirements indicated:
1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
5. Internally brace signs for stability and for securing fasteners.
6. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
7. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

B. Brackets:
1. Fabricate brackets, fittings, and hardware for bracket mounted signs to suit sign construction and mounting conditions indicated. Modify brackets as necessary:
a. Aluminum Brackets: Factory finish brackets with baked enamel or powder coat finish to match sign background color unless otherwise indicated.

2.4 FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

E. Aluminum Finishes:
1. Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.
2. Baked Enamel or Powder Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices and electrical service embedded in permanent construction by other installers by field measurements before fabrication and indicate measurements on Shop Drawings.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of signage work. Verify sign support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

B. Proceed with installation after correcting unsatisfactory conditions.

3.3 INSTALLATION

A. Install signs using mounting methods indicated and according to manufacturer's written instructions:
1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Interior Wall Signs:
   a. Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door:
      1) See drawings for the mounting height and location of each sign.
4. Before installation, verify sign surfaces are clean and free of materials or debris that impair installation.
5. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Height:
   1. Tactile characters on signs shall be located 48 inches minimum to the baseline of the lowest Braille cells and 60 inches maximum to the baseline of the highest line of raised characters above the finish floor or ground surface, pursuant to CBC Section and Figure 11B-703.4.1.

C. Mounting Location:
   1. A tactile sign shall be located as follows, pursuant to CBC Section and Figure 11B-703.4.2:
      a. Alongside a single door at the latch side.
      b. On the inactive leaf at double doors with one active leaf.
      c. To the right of the right-hand door at double doors with two active leafs.
      d. On the nearest adjacent wall where there is no wall space at the latch side of a single door or at the right side of double doors with two active leafs.
      e. So that a clear floor space of 18 inches by 18 inches minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45-degree open position.

D. Mounting Methods:
   1. Exposed Fastener: Install vandal-resistant fastener; set screw head flush with sign face.
   2. Concealed Studs:
      a. Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface:
         1) Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.
         2) Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.
   3. Brackets: Remove loose debris from substrate surface and install backbar or bracket supports in position so that signage is correctly located and aligned.
   4. Shim Plate Mounting: Provide 1/8 inch (3 mm) thick, concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other direct mounting methods are impractical. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach signs to plate using method specified above.

E. Visual Characters shall comply with CBC Section 11B-703.5 and shall be 40 inches minimum above finish floor or ground.

F. Field Applied, Vinyl Character Signs: Clean and dry substrate. Align sign characters in final position before removing release liner. Remove release liner in stages and apply and firmly press characters into final position. Press from the middle outward to obtain good bond without blisters or fishmouths. Remove carrier film without disturbing applied vinyl film.

G. Signs Mounted on Glass: Provide opaque sheet matching sign material and finish onto opposite side of glass to conceal back of sign.

H. DSA Inspections: Signs and identifications or other information shall be field inspected after installation and approved by Division of the State Architect prior to the issuance of a final certificate of occupancy, or final approval where no certificate of occupancy is issued. The inspection shall include, but not limited to, verification that Braille dots and cells are properly spaced, and the size, proportion, and type of raised characters are in compliance with CBC, Section 11B-703.1.1.2.

3.4 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 00

SECTION 10 21 13 TOILET COMPARTMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Solid Color Reinforced Composite (SCRC) Substrate (Bobrick Sierra Series):
   1. Toilet partitions.
   2. Urinal privacy screens.

B. Related Sections:
   1. Section 06 10 00: Rough Carpentry.
   2. Section 10 28 13: Toilet Accessories.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00: Submittal Procedures.

B. Product Data:
   1. Manufacturer's data sheets on each product to be used, including:
      a. Preparation instructions and recommendations.
      b. Storage and handling requirements and recommendations.
      c. Installation methods.

C. Shop Drawings:
   1. Submit manufacturer's shop drawings for each product specified, including the following:
      a. Plans, elevations, details of construction and attachment to adjacent construction.
      b. Show anchorage locations and accessory items.
      c. Verify dimensions with field measurements prior to final production of toilet compartments.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches square representing actual product, color, and patterns.

F. Mock-Up:
   1. Provide a mock-up for evaluation of surface preparation techniques and application workmanship:
      a. Finish areas designated by Architect.
      b. Do not proceed with remaining work until workmanship is approved by Architect.
      c. Refinish mock-up area as required to produce acceptable work.

1.4 PERFORMANCE REQUIREMENTS

A. Accessible Toilet Compartments:
   1. Wheelchair accessible compartment shall comply with CBC Section 11B-604.8.1.

2. Toe clearance for at least one side partition of a wheelchair accessible compartment shall comply with CBC Section and Figure 11B-604.8.1.4. It shall be a minimum of 9 inches high above the finish floor, and a minimum of 6 inches deep beyond the compartment side face of the partition, exclusive of partition support members. It shall be a minimum of 12 inches high above the finish floor for children's use. Partition components at toe clearances shall be smoother without shop edges or abrasive surfaces. Toe clearance at the side partition is not required in a compartment greater than 66 inches wide.
3. Ambulatory accessible compartments shall be provided where there are six or more toilet compartments, or where the combination of urinals and water closets total six or more fixtures. Such compartments shall be provided in the same quantity as wheelchair accessible compartments per CBC Section 11B-213.3.1 and shall comply with CBC Section 11B-604.8.2.
4. Door and door hardware for accessible compartments shall be self-closing and shall comply with CBC Section 11B-404 except that if the approach is to the latch side of an ambulatory compartment door, clearance between the door side of the compartment and any obstruction shall be 44 inches minimum. See CBC Figure 11B-604.8.2.
5. A door pull complying with CBC Section 11B-404.2.7 shall be placed on both sides of the accessible compartment door near the latch.
6. Ambulatory Accessible Toilet Compartment doors shall not swing into the clear floor space or clearance required for any fixture or into the minimum required compartment area. See CBC Section 11B-604.8.2.2.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Accessibility Requirements - Comply with applicable requirements:
      d. Americans with Disabilities Act of 1990, as amended:
         1) ADA Title II Regulations & the 2010 ADA Standards for Accessible Design.
      e. CBC 2022 California Building Code (CCR Title 24, Part 2, as adopted and amended by DSA):
         1) CBC Chapter 11B, Access to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.
   2. Surface Burning Characteristics - Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency:
      a. Flame Spread Index: 25 or less.
      b. Smoke Developed Index: 450 or less.

B. Manufacturer Qualifications: Minimum 10 years' experience manufacturing similar products.

C. Installer Qualifications: Minimum 2 years' experience installing similar products.

D. Single Source Requirements: To the greatest extent possible provide products from a single manufacturer.

E. Preinstallation Meeting:
   1. Convene minimum two weeks prior to starting work of this section.

1.6 WARRANTY

A. Manufacturer's Warranty (Sierra Series): Manufacturer's standard 25-year limited warranty for panels, doors, and stiles against breakage, corrosion, delamination, and defects in factory workmanship. Manufacturer's standard 1-year guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handling: Handle materials to avoid damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Bobrick Washroom Equipment, Inc., which is located at: 6901 Tujunga Ave.; North Hollywood, CA 91605-6213;Basis of Design Products: Based on the quality and performance requirements of the project, specifications are based on the products of Bobrick Washroom Equipment, Inc. www.bobrick.com. Location of manufacturing shall be the United States.

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00: Product Requirements.

2.2 SOLID COLOR REINFORCED COMPOSITE (SCRC) SUBSTRATE (BOBRICK SIERRA SERIES)

A. Solid Color Reinforced Composite (SCRC) Toilet Partitions - Bobrick Sierra Series 1092G.67P:
   1. Design Type:
      c. Standard Height.
         1) Door/Panel Height: 58 inches.
         2) Floor Clearance: 12 inches.
   2. Privacy Style Partitions: No sightlines with gap-free interlocking doors and stiles routed 0.300 inches from the edge to allow for 0.175-inch overlap to prevent line-of- sight into the toilet compartment. Privacy strips fastened or adhered onto the partition material are not acceptable.
   3. Mounting:
      a. Floor-Mounted, overhead-braced with satin finish, extruded anodized aluminum headrails, 0.065-inch-thick with anti-grip profile:
         1) Stile Maximum Height: 83 inches.

B. Solid Color Reinforced Composite (SCRC) Urinal Screens - Bobrick Sierra Series:
   1. Mounting Configuration:
      a. Wall-Hung:
         1) Screen Height: 48 inches with 12 inches floor clearance.

C. Materials:
   1. Solid color reinforced composite (SCRC) material for stiles, panels, doors, and screens with Bobrick Graffiti Off coating, thermoset and integrally fused into homogenous piece; high density polyethylene (HDPE), high density polypropylene not acceptable:
      a. Composition: Dyes, organic fibrous material, and polycarbonate/phenolic resins.
      b. Surface Treatment: Non-ghosting, graffiti resistant surface integrally bonded to core through a manufacturing steps requiring thermal and mechanical pressure.
      c. Edges: Same color as the surface.
      d. Color:
         1) SC04 Forest Green.
      e. Acceptable SCRC Products:
         2) Ultimate Corian System by Shower Shapes.
         3) WilsonArt Gibraltar Material.

4) WilsonArt Earth Stone Material.
5) Or manufacturer approved equal.

D. Performance Requirements:
1. Graffiti Resistance (ASTM D6578): Passed cleanability test; 5 staining agents.
2. Scratch Resistance (ASTM D2197): Maximum load value exceeds 10 kilograms.
3. Impact Resistance (ASTM D2794): Maximum impact force exceeds 30 inch-pounds.
4. Smoke Developed Index (ASTM E84): Less than 450.
5. Flame Spread Index (ASTM E84): Less than 75.
6. National Fire Protection Association/International Building Code Interior Wall and Ceiling Finish: Class B.
7. Uniform Building Code: Class II.

E. Finished Thickness:
1. Stiles and Doors: 3/4 inch.
2. Panels and Screens: 1/2 inch.

F. Stiles:
1. Floor-Anchored stiles furnished with expansion shields and threaded rods:
a. Leveling Devices: 7 gauge, 3/16 inches thick, corrosion-resistant, chromate-treated, double zinc-plated steel angle leveling bar bolted to stile; furnished with 3/8-inch diameter threaded rods, hex nuts, lock washers, flat washers, spacer sleeves, expansion anchors, and shoe retainers.
b. Stile Shoes: One-piece, 22 gauge, 18-8, Type 304 stainless steel, 4-inch height; tops with 90 degree return to stile. One-piece shoe capable of adapting to 3/4 inch or 1-inch stile thickness and capable of being fastened (by clip) to stiles starting at wall line.

G. Anchors: Expansion shields and threaded rods at floor connections as applicable. Threaded rods secured to supports above ceiling as applicable. Supports above ceiling furnished and installed.

H. Hardware:
1. Chrome-plated "Zamak", aluminum, extruded plastic hardware not acceptable:
a. Compliance: Operating force of less than 5 lb.
b. Emergency Access: Hinges, door latch allow door to be lifted over keeper from outside compartment on inswing doors.
c. Materials: 18-8, Type 304, heavy-gauge stainless steel with satin finish.
d. Doorstops: Prevents inswinging doors from swinging out beyond stile; on outswing doors, doorstop prevents door from swinging in beyond stile.
e. Fastening:
1) Hardware secured to door and stile by through-bolted, theft-resistant, pin- in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts. Fasteners secured directly into core not acceptable:
a) Threaded Brass Inserts: Factory-installed; withstand direct pull force exceeding 1500 lb per insert.
f. Clothes Hooks: Projecting no more than 1-1/8 inch from face of door.
g. Door Latch: Track of door latch prevents inswing doors from swinging out beyond stile; on outswing doors, door keeper prevents door from swinging in beyond stile; 16-gauge sliding door latch, 14-gauge keeper.
h. Locking: Door locked from inside by sliding door latch into keeper.
i. Hinge Type:
1) Standard.
a) Balanced, with field-adjustable cam to permit door to be fully closed or partially open when compartment is unoccupied.
j. Mounting Brackets:

1) Full-Height:
   a) Mounting Brackets: 18-gauge stainless steel and extend full height of panel.
   b) U-Channels: Secure panels to stiles.
   c) Angle Brackets: Secure stiles-to-walls and panels to walls.

PART 3 EXECUTION

3.1 PREPARATION

A. Prepare substrates including but not limited to blocking and supports in walls and ceilings at points of attachment using methods recommended by the manufacturer for achieving the best result for the substrates under the project conditions:
   1. Inspect areas scheduled to receive compartments for correct dimensions, plumbness of walls, and soundness of surfaces that would affect installation of mounting brackets.
   2. Verify spacing of plumbing fixtures to assure compatibility with installation of compartments.

B. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions. Do not proceed with installation until substrates have been properly prepared with blocking and supports in walls and ceilings at points of attachment and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

3.2 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

3.3 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

3.4 INSTALLATION

A. Install products in strict compliance with manufacturer's written instructions and recommendations, including the following:
   1. Verify blocking and supports in walls and ceilings has been installed properly at points of attachment.
   2. Verify location does not interfere with door swings or use of fixtures.
   3. Use fasteners and anchors suitable for substrate and project conditions.
   4. Install units rigid, straight, plumb, and level.
   5. Conceal evidence of drilling, cutting, and fitting to room finish.
   6. Test for proper operation.

3.5 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust hardware for proper operation after installation. Set hinge cam on in-swinging doors to hold doors open when unlatched. Set hinge cam on out-swinging doors to hold unlatched doors in closed position.

B. Touch-up, repair or replace damaged products.

C. Clean exposed surfaces of compartments, hardware, and fittings.

END OF SECTION 10 21 13

SECTION 10 21 13.17 PHENOLIC CORE TOILET COMPARTMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Solid Phenolic (SPC) Core toilet partitions, floor mounted, overhead braced.
   2. Related Sections:
      a. Section 06 10 00: Rough Carpentry.
      b. Section 09 21 16: Gypsum Board Assemblies.

1.3 SUBMITTALS

A. Shop Drawings:
   1. Within four (4) weeks of award of contract, submit:
      a. Complete shop drawings for the Architect's approval, showing all required field measurements, all details and elevations, plans and sections required to indicate all conditions.
      b. Manufacturer's installation instructions.
      c. Samples: 2x3 inch samples in each color.

B. Certification: Provide a certificate of compliance attesting that all materials are in accordance with manufacturer’s specifications.

C. Warranty: Twenty fire year against breakage, corrosion and delamination under normal conditions.

1.4 QUALITY ASSURANCE

A. Accessibility Requirements:
   1. Comply with applicable requirements.
      a. Americans with Disabilities Act of 1990, as amended.
         1) ADA Title II Regulations & the 2010 ADA Standards for Accessible Design.
      b. CBC 2022 California Building Code (CCR Title 24, Part 2, as adopted and amended by DSA).
         1) CBC Chapter 11B, Access to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.

B. Manufacturer Qualifications: Minimum 5 years’ experience in manufacture of solid plastic toilet compartments with products in satisfactory use under similar service conditions.

C. Installer Qualifications: Minimum 5 years’ experience in work of this Section.

D. Field Measurements:
   1. Field verify dimensions prior to submittals and fabrication.

E. Accessible Toilet Compartments:
   1. Wheelchair accessible compartment shall comply with CBC Section 11B-604.8.1.

2. Toe clearance for at least one side partition of a wheelchair accessible compartment shall comply with CBC Section and Figure 11B-604.8.1.4. It shall be a minimum of 9 inches high above the finish floor, and a minimum of 6 inches deep beyond the compartment side face of the partition, exclusive of partition support members. It shall be a minimum of 12 inches high above the finish floor for children's use. Partition components at toe clearances shall be smoother without shop edges or abrasive surfaces. Toe clearance at the side partition is not required in a compartment greater than 66 inches wide.
3. Ambulatory accessible compartments shall be provided where there are six or more toilet compartments, or where the combination of urinals and water closets total six or more fixtures. Such compartments shall be provided in the same quantity as wheelchair accessible compartments per CBC Section 11B-213.3.1 and shall comply with CBC Section 11B-604.8.2.
4. Door and door hardware for accessible compartments shall be self-closing and shall comply with CBC Section 11B-404 except that if the approach is to the latch side of an ambulatory compartment door, clearance between the door side of the compartment and any obstruction shall be 44 inches minimum. See CBC Figure 11B-604.8.2.
5. A door pull complying with CBC Section 11B-404.2.7 shall be placed on both sides of the accessible compartment door near the latch.
6. Ambulatory Accessible Toilet Compartment doors shall not swing into the clear floor space or clearance required for any fixture or into the minimum required compartment area. See CBC Section 11B-604.8.2.2.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Any one (1) of the following manufacturers whose product meets or exceeds the specifications for those specified is approved for use on the Project. Other manufacturers must have a minimum of five (5) years' experience manufacturing products meeting or exceeding those specified for design, size, finish, and fabrication and comply with Division 01 requirements for substitutions in order to be considered:
   1. Scranton Products, Scranton, PA.
   2. Or Architect approved substitute.

2.2 MATERIALS

A. Basis of Design: Hiny Hiders by Scranton Products.

B. Doors, Panels and Pilasters:
   1. High density polyethylene (HDPE), fabricated from polymer resins compounded under high pressure, forming single thickness panel.
   2. Waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.
   3. 1 inch thick with edges rounded to 1/4-inch radius.
   4. CBC 803.1.1. interior wall and ceiling finish materials shall be classified in accordance with NFPA 286 and CBC Section 803.1.1.1.

C. Headrail: heavy duty aluminum extrusions, anodized with anti-grip configuration, and shall be fastened to the pilaster tops.

2.3 HARDWARE

A. Hinges:
   1. 8 inches long, fabricated from heavy-duty extruded aluminum with bright dip anodized

finish, wrap-around flanges, adjustable on 30-dregree increments, through bolted to doors and pilasters with stainless steel, Torx head sex bolts.
2. Hinges operate on field-adjustable nylon cams, field adjustable in 30-degree increments.
3. Operate accessible stalls per 11B-404.2.9.

B. Door Strike and Keeper:
1. 6 inches long, fabricate from heavy-duty extruded aluminum with bright dip anodized finish, with wrap-around flanges secured to pilasters with stainless steel tamper resistant Torx head sex bolts.
2. Bumper: Extruded black vinyl.
3. Accessible compartment: 11B-604.8.1.

C. Latch and Housing:
1. Heavy-duty extruded aluminum.
2. Latch housing: Bright dip anodized finish.
3. Slide bolt and button: Black anodized finish.
4. Accessible Latch to comply with 11B-404.

D. Coat Hook/Bumper:
1. Combination type, chrome plated Zamak.
2. Equip outswing handicapped doors with second door pull and door stop.
3. Coat Hook Location:
a. Accessible Stalls only: 11B-602 through 11B-612.
1) Height: 48 inches A.F.F. maximum.

E. Door Pulls: Chrome plated Zamak.
1. Accessible Stalls: 11B-404.2.7.

F. Accessible Toilet Compartments:
1. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds maximum. CBC Section 11B-604.8.1.

2.4 COMPONENTS

A. Doors and Dividing Panels: 55 inches high, mounted 14 inches above finished floor with aluminum heat-sinc fastened to bottom edges.

B. Pilasters: 82 inches high, fastened to pilaster sleeves with stainless steel tamper resistant Torx head sex bolt.

C. Pilaster Sleeves: 3 inches high, one-piece molded HDPE, secured to pilaster with stainless steel tamper resistant Torx head sex bolt.

D. Wall Brackets: 54 inches long, extruded PVC fastened to pilaster and panels with stainless steel tamper resistant Torx head sex bolts.

E. Color: Black.

F. Headrail: Heavy-duty extruded aluminum, anti-grip design, 20ga statin finish, fastened to headrail bracket with stainless steel tamper resistant Torx head sex bolt and at top of pilaster with stainless steel tamper resistant Torx head screws.

G. Headrail Brackets: 20 gage stainless steel, satin finish, secured to wall with stainless steel

tamper resistant Torx head screws.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's printed instructions.

B. Install all toilet partitions where indicated on the drawings, and as indicated on the shop drawings, anchoring all components firmly in place for long life under hard use and in complete accordance with the manufacturer's recommendations.

C. Provide blocking/anchoring devices to secure to wall. Anchoring devices must be compatible to wall type to ensure adequate strength.

3.2 CLEANING AND ADJUSTING

A. Clean surfaces free of dirt, oil, grease and other contaminants which detract from appearance of partitions.

B. Except for compartments for the handicapped, adjust doors to remain at a uniformly open position when unlocked.

3.3 REPLACEMENT OF DEFECTIVE MATERIALS

A. Defaced, damaged, scratched or marred materials will not be permitted, will be considered defective, and rejected. Rejected materials shall be replaced with new materials at no additional expense to Owner.

END OF SECTION 10 21 13.17

SECTION 10 28 13 TOILET ACCESSORIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements including but not limited to:
1. Public use washroom accessories.
2. Public use shower room accessories.
3. Private use bathroom accessories.
4. Healthcare accessories.
5. Warm air dryers.
6. Childcare accessories.
7. Underlavatory guards.
8. Custodial accessories.
9. Accessories necessary for a complete installation.

1.3 PERFORMANCE REQUIREMENTS

A. Sanitary Facility Elements:
1. Elements of sanitary facilities shall be mounted at locations in compliance with CBC Sections 11B-602 through 11B-612.
2. Grab bars in toilet facilities and bathing facilities shall comply with CBC Section 11B-609.
3. Grab bars and any wall or other surfaces adjacent to grab bars shall be free of sharp or abrasive elements and shall have rounded edges. The space around the grab bars shall be as follows:
a. 1 ½ inches between the grab bar and the wall.
b. 1 ½ inches minimum between the grab bar and projecting objects below and at the ends.
c. 12 inches minimum between the grab bar and projecting objects above.
4. Grab Bars to meet DSA IR 16-12 – Grab Bar Design and Connections: CBC.
a. Grab Bars shall be designed to resist a single concentrated load of 250 lbs. applied in any direction at any point o the grab bar such as to produce the maximum load effect.

1.4 SUBMITTALS

A. Product Data:
1. Technical Data including construction details, material descriptions, dimensions of individual components and profiles, and finishes:
a. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
b. Include electrical characteristics.

B. Samples:
1. Full size, for each exposed product and for each finish specified:
a. Approved full size Samples will be returned and may be used in the Work.

C. Product Schedule: Show types, quantities, sizes, and installation locations by room of each accessory required. Identify locations using room designations indicated.

D. Maintenance Data: Submit for inclusion in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Accessibility Requirements:
   1. Comply with applicable requirements:
      a. Americans with Disabilities Act of 1990, as amended:
         1) ADA Title II Regulations & the 2010 ADA Standards for Accessible Design
      b. California Building Code (CCR Title 24, Part 2, as adopted and amended by DSA):
         1) CBC Chapter 11B, Access to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Source Limitations: Obtain products from single source from single manufacturer.

1.6 WARRANTY

A. Written warranty signed by manufacturer in which manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period:
   1. Failures include, but are not limited to, visible silver spoilage defects.
   2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers:
   1. Toilet accessories schedule is based on Bobrick Washroom Equipment. Subject to compliance with requirements, provide products by one of the following:
      a. Bobrick Washroom Equipment, Inc. Basis of Design.
      b. AJW Architectural Products.
      c. American Specialties, Inc.
      d. Bradley Corporation.
      e. Brey-Krause Manufacturing Co.
      f. GAMCO Specialty Accessories; a division of Bobrick.
      g. Tubular Specialties Manufacturing, Inc.

B. Stainless Steel: ASTM A666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.

C. Brass: ASTM B19, flat products; ASTM B16/B16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B30, castings.

D. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.

E. Galvanized Steel Sheet: ASTM A653/A653M, with G60 (Z180) hot dip zinc coating.

F. Galvanized Steel Mounting Devices: ASTM A153/A153M, hot dip galvanized after fabrication.

G. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

H. Mirrors: ASTM C1503, Mirror Glazing Quality, clear glass mirrors, nominal 6.0 mm thick.

I. Electric Dryer:
   1. Product - Model RA5-974 by World Dryer:
      a. Material: Cover made of 1/4” thick cast iron with porcelain enamel finish.
      b. Motor shall be universal type, 1/10 HP at 7500 RPM. Dryers shall deliver 200 cubic feet per minute of air volume (7300 LFM).
      c. Timer shall be electromechanical cam-style with 25 AMP rated switch to operate dryer for 30 second period on push button units.
      d. Infrared sensor detects hands, initiates and terminates drying on automatic units.
      e. Recessed units are made with cast iron covers and use a 16-gauge steel wall mounting box.
      f. Hand dryers shall be listed under reexamination service of Underwriters Laboratories, Inc.

2.2 COMPONENTS

A. Underlavatory Guard:
   1. Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with piping and/or burns from piping; allow service access without removing coverings:
      a. Product: Truebro LavShield Protective Lavatory Enclosure.
      b. Material and Finish: Antimicrobial, molded plastic, white.
      c. Provide at all lavatories.

2.3 FABRICATION

A. Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 EXECUTION

3.1 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

3.2 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested

according to ASTM F446.

3.3 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items. Remove temporary labels and protective coatings. Clean and polish exposed surfaces according to manufacturer's written recommendations.

PART 4 SCHEDULE

4.1 ACCESSORY SCHEDULE

A. TA-1 - Soap Dispensers:
   1. Mounting: Surface.
   2. Model No.: B-2111 (vertical)
   3. Model No.: B-2112 (horizontal).
   4. Locations: Refer to drawings.

B. TA-1(a) – Multiple Soap Dispensers:
   1. Multi-Feed Soap Dispensing System: B-820 Automatic, with 820-248 Automatic Foam Dispenser or 820-258 Automatic Liquid Dispenser.

C. TA-2 - Mirrors:
   1. Mounting: Surface.
   2. Model No.: B-290.
   3. Size: 24 inches by 36 inches (600 mm by 900 mm), unless shown otherwise.
   4. Locations: Refer to drawings.

D. TA-3 - Toilet Paper Dispensers (At Typical Non-accessible Toilet Stalls):
   1. Mounting: Surface.
   2. Model No.: B-2888.
   3. Locations: Non-accessible water closets and toilet stalls.

E. TA-4 - Paper Towel Dispensers:
   1. Mounting: Surface (Less than 4” projection)
   2. Model No.: B-262.
   3. Locations: Refer to drawings.

F. TA-5 - Grab Bars: Typical Accessible Toilet Stalls:
   1. Size/Finish: 42” x 1-1/2 inch diameter satin stainless steel
   2. Clearance: 1-1/2 inch between rail and wall.
   3. Model No.: B-6806.
   4. Mounting: Attach with concealed mounting kit. Mount parallel to floor.
   5. Location: Accessible water closets and toilet stalls.

G. TA-6 - Sanitary Napkin Dispensers:
   1. Mounting: Recessed.
   2. Model No.: B-2706.
   3. Operation: Single coin / Double coin - (25/50 cents).
   4. Capacity: 20 Napkins/ 30 Tampons.
   5. Locations: Women’s toilet room.

H. TA-7 - Sanitary Napkin Disposal:
   1. Mounting: Surface.
   2. Model No.: B-270.

3. Capacity: 1.0 gal.
4. Locations: Women's toilet stalls.

I. TA-8 - Mop and Broom Holder:
1. Mounting: Surface.
2. Model No.: B-239 x 34.
3. Capacity: Four hooks, three mop holders.
4. Locations: Mop sink at each custodial rooms.

J. TA-9 - Grab Bars: (At Accessible Shower):
1. Mounting: Surface.
2. Model: B-6861 modified (24 x 16).
3. Locations: Accessible shower stalls.

K. TA-10(a) - Folding Benches: Adult Height:
1. Mounting: Surface, reversible.
2. Models: B-5181.
3. Locations: Accessible shower stalls.

L. TA-10(b) - Folding Benches, Child Height (15 inch (375 mm) seat height):
1. Mounting: Surface, reversible.
2. Models: Bradley 9561.
3. Locations: Accessible shower stalls.

M. TA-11 - Clothes Hook:
1. Mounting: Surface.
2. Model No.: B-6717.
3. Locations: All shower locations.
4. Toilet and Shower Partitions: If toilet and shower partitions are utilized, hooks are to be provided by the partition manufacturer(s) as part of their hardware package.

N. TA-12 - Shower Curtains, Rods and Hooks:
1. Rods: B-047 (36 inches or as indicated).
2. Curtains: B-6047 to 72" (42 inches x 72 inches or as required).
3. Hooks: B-204-1.
4. Mounting/Locations: Accessible shower stalls.

O. TA-13(a) - Electric Hand Dryers:
1. Mounting: Semirecessed, maximum 3-9/16 inch recess.
2. Model No.: B-750, white.
3. Voltage: 120 volt, single phase.
4. Location: Refer to drawings.

P. TA-13(b) – Paper Towel Dispenser:
1. Mounting: Surface mount..
2. Model No.: B-26212, white.
3. Location: Refer to drawings.
4. Dimensions: 10 ¾" W x 7 1/8" H x 4" Deep.

Q. TA-14 - Paper Towel Dispenser/Trash Receptacle Combination:
1. Mounting: Surface.
2. Model No.: B-3949.
3. Locations: Refer to drawings.

R. TA-15 - Grab Bars: (At Typical Semi-ambulatory Toilet Stalls):

1. Size/Finish: 42” x 1-1/2 inch diameter satin stainless steel
2. Clearance: 1-1/2 inch between rail and wall.
3. Model No.: B-6806-42.
4. Mounting: Attach with concealed mounting kit. Mount parallel to floor.
5. Location: Semi-ambulatory toilet stalls.

S. TA-16 - Diaper Changing Stations:
1. Type: Horizontal station to accommodate infants and toddlers.
2. Construction and Features:
   a. FDA approved injection molded polypropylene with steel on steel hinge system. Fabricate to withstand static loads over 400 pounds.
   b. Child protection straps with snap lock fasteners.
   c. Built in diaper bag hooks.
   d. Built in sanitary liner dispensers; 3 ply, biodegradable.
   e. Premium gas spring mechanism.
   f. Molded usage and safety instructions in six languages and Braille.
   g. ADA compatible.
   h. Antifungal to comply with ASTM standards.
3. Color: Selected by Architect from the full list of standard colors.
4. Dimensions: 35 inches long by 22 inches high by 4 inches deep (875 mm by 550 mm by 100 mm).
5. Approved Product/Manufacturer: Koala Bear Kare Baby Changing Stations, Model KB 300, manufactured by Koala Bear Kare.

T. TA-16(a) – Adult Changing Station:
1. Type: Horizontal station to accommodate Adult sizes.
2. Construction and Features:
   a. FDA approved injection molded polyurethane stretcher size bed with drain holes bed on stainless steel frame system with side, head and foot safety rails. Fabricate to withstand static loads over 400 pounds.
   b. Built-in tilting headrest and footrest.
   c. Built-in integrated water collection tray.
   d. Electric operated height adjustment (110V – 60Hz 650W).
   e. Molded usage and safety instructions in six (6) languages and Braille.
   f. ADA compatible.
   g. Antifungal to comply with ASTM standards.
   h. LED integrated lighting system with multi-color variant.
   i. Hold-in-place gas struts.
   j. Battery back-up operation (for power failures safe lowering).
   k. Handset control device.
3. Color: Selected by Architect from the full list of standard colors.
4. Dimensions: 87.5 inches long by 36 inches wide and adjustable height variant from high by 6 inches (6”) to 35 inches.
5. Approved Product/Manufacturer: Astor Bannerman Ltd./Harbor Medical Inc., 3519 Glen Oak Drive, Jarrettsville, MD 21084 1-800-587-7001 - Model CTX Adult Changing Table.

U. TA-17 - Trash Receptacle:
1. Mounting: Recessed
2. Model No.: B3644.
3. Locations: Refer to drawings.

V. TA-18 - Toilet Paper Dispensers:
1. Mounting: Semi-recessed (Less than 4” projection).
2. Model No.: B-3888.
3. Location: Accessible water closets and toilet stalls.

W. TA-19 - Seat Cover Dispenser:
   1. Mounting: Surface.
   2. Model No.: B-221
   3. Location: All water closets and toilet stalls.

X. TA-20 - Sanitary Napkin Disposal:
   1. Mounting: Recessed.
   2. Model No.: B-353.
   3. Locations: Women's accessible toilet stalls.

END OF SECTION 10 28 13

SECTION 10 44 00 FIRE EXTINGUISHER AND CABINETS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:
1. Fire Extinguisher Cabinets.
2. Fire Extinguishers

B. Related Sections:
1. Section 06 10 00: Rough Carpentry.

1.3 SUBMITTALS

A. Product Data:
1. Manufacturer's specifications and technical data to indicate specification compliance.
2. Manufacturer’s installation instructions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Specifications are based on the products of named manufacturers. Other listed manufacturers who produce products equivalent to those specified are approved for use on the Project. Other manufacturers must have a minimum of five (5) years’ experience manufacturing equivalent to those specified and comply with Division 01 requirements regarding substitutions to be considered:
1. Larsen's Manufacturing Co.
2. The Williams Bros. Corporation of America.
3. J. L. Industries, Inc.
4. Potter-Roemer.

2.2 MATERIALS

A. Fire Extinguishers and Cabinets must comply with CBC Sections 11B-307, 11B-308, 11B-309, and 11B-403.

B. Fire Extinguisher Cabinets (FEC):
1. Size: 24 inches x 9-1/2 inches x 6 inches inside tub dimension.
2. Type: Semi-recessed with 2-1/2 inch return trim rolled edge; ADA compliant.
3. Tub Construction: 22 gauge min. steel with standard baked acrylic enamel interior finish.
4. Door and Frame: 18 gauge min. 304 stainless steel door and frame with vertical decal lettering "FIRE EXTINGUISHER" in red color, unless directed otherwise by Architect.
5. Glazing: clear acrylic “Duo” vertical glazing panel
6. Hardware: Continuous concealed piano hinge constructed of material which matches door and trim material. Satin finish pull handle with cam cylinder lock with safety pull designed to release upon firm pull on handle (Larsen’s “Larsen-Loc”™, J.L. Industries

"Saf-T-Lok"™; or equivalent).

7. Bracket: Hook type; Larsen's #1007, or equal.
8. Finish of Exterior: #4 Stainless steel.
9. Fire rating: as occurs, provide fire rated cabinet, for one or two hour rated conditions as indicated or required by specific location. Cabinet shall be tested and approved by Warnock Hersey to ASTM E814, and shall bear the Warnock Hersey label.

C. Fire Extinguishers (F.E):
   1. Models/Types:
      a. Multipurpose dry chemical with 10 lbs. capacity: C rating conforming to MP10 Series. UL Rating: 4A:80B:C.
      b. Wet-Chemical Type, WC Series, (FE-K): UL-rated 2-A: K, 2.5-gal. (9.5-L) nominal capacity, with potassium carbonate-based chemical in stainless-steel container; with pressure-indicating gage.
   2. Mounting: Provide eye brackets for direct wall mounting to hook and for mounting in Fire Extinguisher cabinets. Refer to drawings for location and quantity.
   3. Provide initial inspection tag for each extinguisher.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install fire extinguishers and cabinets in openings in accordance with manufacturer's printed instructions.

B. Install fire extinguishers and cabinets where indicated on the drawings, or if not indicated, in locations required by governing code and as directed by Owner.

END OF SECTION 10 44 00

SECTION 12 24 13 ROLLER WINDOW SHADES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes window shades:
   1. Manual operation – Default.
   2. Motorized operation – Use with District permission only.

1.3 WARRANTY

A. Special Warranty:
   1. Manufacturer's standard form in which manufacturer agrees to repair or replace components of roller shades that fails in materials or workmanship within specified warranty period:
      a. Warranty Period: Lifetime.

B. Installer’s Warranty: 1 year.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Roller shades are subject to compliance with requirements. Provide either the named product or an equal product by one of the other manufacturers specified:
   1. MechoShade Systems, Inc. (District Standard) Sonny Flink 818-346-0308:
      a. Local Contact: Don 805-481-2761.
   2. Draper Inc.
   3. Silent Gliss USA, Inc.
   4. Hunter Douglas.
   5. Or approved equal.

2.2 ROLLER SHADES

A. Solar Shade Cloth:
   1. ThermoVeil 1300 Series basket weave shadecloths in 2 non-directional 2 x 2 basket-weave. Uniform scrim effect at the window wall with appropriate densities for sun control.
   2. Content: 79% vinyl, 21% polyester core.
   3. UV Test 200 sun-fade hours: None
   4. 500 sun-fade hours: 5%.
   5. Openness Factor: ±5%.
   6. Color: Selected from manufacturer's standard colors.

B. Blackout Shadecloths:
   1. ThermoVeil 0700 series, blackout material, washable and colorfast laminated and embossed vinyl coated fabric, 0.012 inches thick blackout material and weighing 0.81 lbs. per square yard, with a minimum of 62 threads per square inch.

2. Content: 79% vinyl, 21% polyester core.
3. Transparency: Opaque.
4. Color: As selected by Architect from manufacturer's standard colors.

2.3 ACCESSORIES

A. Roller Shade Pocket:
1. For recessed mounting in acoustical tile, or drywall ceilings as indicated on the Drawings:
   a. Product: 1-1/2” by 6” clear anodized aluminum.
   b. Provide either extruded aluminum and or formed steel shade pocket, sized to accommodate roller shades, with exposed extruded aluminum closure mount, tile support and removable closure panel to provide access to shades:
      1) Provide "Vented Pocket" such that there will be a minimum of four 1-inch diameter holes per foot allowing the solar gain to flow above the ceiling line.
   c. Pocket Accessories: As indicated on the Drawings.

B. Fascia:
1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
2. Fascia shall be able to be installed across two or more shade bands in one piece.
3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.
5. Notching of Fascia for manual chain shall not be acceptable.

C. Room Darkening Side and Sill Channels:
1. Extruded aluminum with polybond edge seals and SnapLoc-mounting brackets and with concealed fastening. Exposed fasting is not acceptable. Channels shall accept one-piece exposed blackout hembar with vinyl seal to assure side light control and sill light control.
   a. MechoShade side channels, 1-15/16 inches wide by 1-3/16 inches deep, two-band center channels, 2-5/8 inches wide by 1-3/16 inches deep. The 2-5/8-inch double-center channels may be installed at center-support positions of multi-band-shade ElectroShades. MechoShade side channels 2-5/8 inch may be used as center supports for ElectroShades; shadebands up to 8 high. For shadebands over 8 feet, provide ElectroShade side channels.
   b. ElectroShade side channels, 2-1/2 inches wide by 1-3/16 inches deep; two-band center channels 5 inches wide by 1-3/16 inches deep. The 2-5/8-inch double-center channels may be installed at center-support positions of multi-band-shade ElectroShades. MechoShade side channels 2-5/8 inches may be used as center supports for ElectroShades. Also provide for use with manually operated room darkening MechoShades over 8 feet in height.

2.4 SHADE BAND

A. Shade Bands:
1. Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable:
   a. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.
   b. Shade Band and Shade Roller Attachment:

1) Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch in diameter for manual shades, and less than 2.55 inches for motorize shades are not acceptable.
2) Provide for positive mechanical engagement with drive / brake mechanism.
3) Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" snap-off" spline mounting, without having to remove shade roller from shade brackets.
4) Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
5) Any method of attaching shade band to roller tube that requires the use of adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.5 SHADE FABRICATION

A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.

B. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch in either direction per 8 feet of shade height due to warp distortion or weave design. Fabricate hem as follows:
1. Standard concealed hem bar.

2.6 COMPONENTS

A. Access and Material Requirements:
1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.

B. Manual Operated Chain Drive Hardware and Brackets:
1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
3. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
4. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.
5. Provide shade hardware system that allows multi-banded manually operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
6. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not

acceptable

7. Provide shade hardware constructed of minimum 1/8-inch thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
8. Drive Bracket / Brake Assembly:
   a. MechoShade Drive Bracket model shall be fully integrated with all MechoShade accessories, including, but not limited to: SnapLoc fascia, room darkening side / sill channels, center supports and connectors for multi-banded shades.
   b. M5 drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch steel pin.
   c. The brake shall be an over-running clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. in the stopped position.
   d. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
   e. The entire M5 assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
   f. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. minimum breaking strength. Nickel plate chain shall not be accepted.

C. Motorized Operating System:
   1. Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system:
      a. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
      b. Electric Motor: Manufacturer's standard tubular, enclosed in roller.
      c. Remote Control:
         1) Electric controls with NEMA ICS 6, Type 1 enclosure for recessed or flush mounting. Provide the following for remote-control activation of shades:
            a) Individual Switch Control Station: Three-position, toggle-style, wall-switch-operated control station with open, close, and center off functions.
            b) Group Control Station: Three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for single-switch group control.
            c) Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features; isolated from voltage spikes and surges.
      d. Limit Switches: Adjustable switches interlocked with motor controls and set to stop shades automatically at fully raised and fully lowered positions.
      e. Operating Features:
         1) Group switching with integrated switch control; single faceplate for multiple switch cutouts.

PART 3 EXECUTION

3.1 ROLLER-SHADE INSTALLATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Install roller shades level, plumb, and aligned with adjacent units, according to manufacturer's written instructions:
   1. Opaque Shadebands: Located so shadeband is not closer than 2 inches (50 mm) to interior face of glass. Allow clearances for window operation hardware.

D. Electrical Connections: Connect motor-operated roller shades to building electrical system.

E. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

F. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.

END OF SECTION 12 24 13

SECTION 12 93 13 BICYCLE RACKS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUBMITTALS

A. Product Data: Include full range of standard color selections.

B. Shop Drawings: Indicate materials, dimensions, tolerances, welding, fasteners, hardware, mounting, finish, and accessories.

C. Quality Assurance Submittals:
1. Qualifications: Proof of manufacturer qualifications.
2. Manufacturer’s Installation Instructions.

1.3 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer Qualifications: Minimum five years’ experience in producing bicycle racks of the type specified.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.

C. Handling: Protect materials and finish from damage during handling and installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers listed whose product meet or exceed the specifications are approved for use on the Project. Other manufacturers must have a minimum of five (5) years’ experience manufacturing products meeting or exceeding the specifications and comply with requirements regarding substitutions to be considered:
1. Ground Control Systems: Basis of Design.
2. AAA Ribbon Rack Co., Inc.
3. Bike Security Racks, Co., Inc.
4. Huntco Supply, LLC.

2.2 BICYCLE RACKS

A. Bike Docks:
1. The Varsity Bike Dock (DV215) or comparable product approved by Architect:
a. Steel: Refer to drawings for location and count:

1) ASTM A36 Steel for all structural steel plates.
2) ASTM A53 Steel for all pipes.

b. Guards: Two cushioned black injection molded urethane “Smart Guards” that attach to the Locking Loops (Wings).
c. Rail Docks: Ground mounted with wedge anchors provided by manufacturer.
d. Stem Angle: To provide handle-bar management.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which bicycle racks will be installed:
1. Verify that surfaces are clean, flat and level.

B. Coordinate with responsible entity to perform corrective Work on unsatisfactory substrates.

C. Commencement of Work by installer is acceptance of substrate.

3.2 INSTALLATION

A. Install bicycle racks in accordance with manufacturer’s installation instructions.

B. Install bicycle racks level, plumb, square, accurately aligned, correctly located per drawings, and without warp.

C. Embedded mounting: Direct embedment of bicycle rack to be minimum of 10 1/2 inches in concrete in accordance with manufacturer’s instructions.

D. Use hardware and fasteners in accordance with manufacturer’s instructions.

E. Repair minor damage to finishes in accordance with manufacturer’s instructions and as approved by Architect.

3.3 CLEANING

A. Follow manufacturer’s instructions.

3.4 PROTECTION

A. Protect bicycle racks from damage due to other construction operations.

END OF SECTION 12 93 13

SECTION 13 34 23 PRE-ENGINEERED MODULAR BUILDINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes but is not limited to:
   1. Pre-engineered, steel frame, clear span modular buildings, one-story, concrete slabs-on-grade and foundations, fully code-compliant, complete and ready for use.
   2. Design and engineering services, labor, materials, equipment, and other services required to obtain approval from the Division of the State Architect (DSA) and complete this work.
   3. Transportation from the factory to the site, erection, installation and finishing at the site including all materials, equipment and operations described in the Contract Documents.
   4. Connection of site utilities.

B. Related Sections:
   1. Section 01 33 00: Submittal Procedures.
   2. Section 03 30 00: Cast-in-Place Concrete.
   3. Section 06 10 00: Rough Carpentry.
   4. Section 08 71 00: Door Hardware.
   5. Section 09 90 00: Painting and Coating.
   6. Section 31 00 00: Earthwork.
   7. Other related work is specified in pertinent sections elsewhere in the Contract Documents and may or may not be noted in this Section.

C. Information Available to Bidders: Geotechnical Engineering and Geologic Hazards Study, prepared by (Terracon).

D. Reference Standards:
   1. AISC 5335 Specification for Structural Steel Buildings - Allowable Stress Design, Plastic Design; American Institute of Steel Construction, Inc.
   2. 2022 California Building Code (CBC), Part 2.
   3. Division of the State Architect; Interpretation of Regulations (IR) Manual, latest edition.

E. Design Requirements:
   1. Contractor's responsibility for completion of design:
      a. Contract Document Drawings for buildings specified in this Section are conceptual in nature and are intentionally not complete designs. All elements required for buildings to be fully code-compliant, complete, and ready for use are therefore purposely not shown in these schematic drawings.
      b. A significant part of the work of this Section to be provided by Contractor is completion and coordination of the design in accordance with these initial concepts and the Contract Documents.
      c. Review and become familiar with the documents, assume responsibility for design completion of building systems in accordance with these specifications, and provide fully code-compliant buildings, complete and ready for use, free of conflict

or omission.

2. Contractor shall provide and pay for all of the following items necessary for proper execution and completion of the Work, temporary or permanent, and whether incorporated, or to be incorporated into the Work:
   a. Design and engineering services.
   b. Labor.
   c. Materials.
   d. Equipment.
   e. Tools.
   f. Construction equipment and machinery.
   g. Water.
   h. Heat.
   i. Utilities.
   j. Factory or plant facilities off the Owner's site.
   k. Transportation.
   l. All other facilities and services necessary, wherever located.
3. Building design to be slab-on-grade building. No floor-system designs permitted. Building manufacturer to submit a half-sized (approx. 15" x 22") set of drawings of a recently completed similar DSA-approved project with bid.
4. The modular building manufacturer must also be the General Contractor and installer of the building. No building-brokering allowed.
5. Contractor shall be responsible for selecting and coordinating all construction means, methods, techniques, sequences, and procedures.
6. Fabrication criteria:
   a. Buildings shall be clear span construction with no interior columns or pilasters. Steel columns at modular corners is acceptable.
7. Design load criteria:
   a. Roof live load: 20 psf.
   b. Wind load: 90 mph, Exposure C, include positive and negative wind loading. Conform to applicable requirements of DSA IR 16-4 "Wind Load Design for One-Story Relocatable School Buildings (Less than 2000 s.f. in Floor Area).”
   c. Seismic loads: Ss = 0.645; Soil site: Class D; Seismic design category D.
   d. Collateral loads: Dead loads of building systems, in addition to the dead load of the building itself, including but not limited to, fire sprinkler systems and roof mounted equipment or elements.
8. Energy conservation: All work shall be subject to Title 24, CCR, Building Standards, Part 6, Division T20, Chapter 2, Sub-Chapter 4, Article 2, on energy conservation regulations and required certification.
9. Design buildings to be transportable:
   a. Modules capable of transportation on trailers allowed for shipping on public streets and highways. The uppermost portion of the module or panel shall not exceed 16 feet from the road surface during transport.
10. Provide weathertight and watertight construction.
11. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range not exceeding that of the maximum annual range of variation found at the Project site, as determined by the National Weather Service records.
12. Review Contract Documents thoroughly prior to bid. Design buildings and size components to meet performance requirements indicated, coordinate systems to avoid conflicts, and provide all elements necessary to conform to the requirements of this specification and complete the Project for occupancy and use subject to all requirements of prevailing codes.
13. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.
14. Provide secure and safe designs conforming to standards of care for similar work

prevailing in the area where the Project is located.

1.3 SUBMITTALS

A. Construction Documents
1. Submit to the Architect, not more than 30 days after Notice to Proceed, complete plans and specifications, including structural, mechanical, fire sprinkler, and electrical design drawings and details, energy efficiency compliance documentation, each complete with all necessary supporting calculations, which are complete and as required to obtain approval of Division of the State Architect (DSA) through a standard DSA plan review and "backcheck" process, or [ ].
2. All drawings, details, specifications, and calculations shall be stamped and signed by an architect, structural engineer, mechanical engineer, and electrical engineer, and professionals of such other disciplines as may be necessary or required, all currently licensed by the State of California. These professionals shall be selected and paid by Contractor.
3. Architect will review and comment on these submittal documents and return to Contractor for corrections.
4. Contractor shall incorporate all notations, revisions or corrections required by Architect within 14 days of receipt by the Contractor. After corrections noted by Architect have been made, Architect will review the corrected documents and shall submit documents to DSA for approval. Contractor shall not submit any document directly to DSA, all submittals shall be made only by Architect.
5. Following return of reviewed documents from DSA, Architect will review and record DSA comments and transmit document to Contractor for corrections.
6. Contractor shall incorporate all notations, revisions or corrections required by DSA and Architect within 14 days of receipt by the Contractor. After corrections noted by DSA and Architect have been made, Architect will review the corrected documents and shall schedule DSA backcheck appointment for approval. Contractor shall not submit any document directly to DSA, all submittals shall be made only by Architect.
7. Architect and Contractor, together with the Contractor's design professionals as may be required, will attend the DSA backcheck to perform final review and corrections necessary to receive DSA approval. Architect will attend all DSA appointments.
8. In the event that more than one backcheck appointment is required to achieve DSA approval, the Owner may back charge Contractor for the costs of Architect's attendance of additional appointments. Such back charges will be implemented in the manner described elsewhere in the Contract Documents.
9. All costs for production and revision of submittal documentation shall be borne by Contractor.
10. Final DSA-approved documents with original stamps and signatures of design engineers, responsible parties and DSA will be retained by the Architect. Copies will be provided to Contractor for his use in production of buildings.

B. Shop Drawings:
1. Indicate assembly dimensions, locations of structural members, connections.
2. Wall and roof system dimensions, general construction details, anchorages and method of anchorage, installation, and door, window, and finish schedules.
3. All details necessary to describe the complete building, systems, and components and their relationships to work provided under separate contracts; framing anchor bolt settings, sizes, and locations from datum, structural attachments.
4. Indicate welded connections with AWS A2.4 welding symbols.
5. Indicate net weld lengths.
6. Provide professional seal and signature. Clearly indicate all conditions deviating from Architect's design document with manufacturer-proposed resolution and request for direction or approval of alternate proposal by Architect.

7. Initial submittal to the Architect: One (1) reproducible and three (3) prints of complete sets of drawings, calculations, and specifications, complete with original stamps and signatures of all design professionals.

C. Samples: Submit two (2) samples of factory finished materials for each material, product, and color selected, eight by ten inch (8” x 10”) in size, or as otherwise specified in the related Sections, illustrating color and texture of finish.

D. Manufacturer’s Instructions: Indicate preparation requirements, anchor bolt placement, and all information necessary to coordinate work provided by separate contracts.

E. Submit original written certifications of the manufacturer and installer qualifications specified in Quality Assurance paragraphs of this Section.

F. Project Record Documents: Record all changes made during construction and actual locations of concealed components and utilities.

1.4 PERFORMANCE REQUIREMENTS

A. Performance requirements:
1. Design, fabricate, and erect building structure and exterior cladding to withstand:
   a. Loads from wind, seismic, gravity, thermally induced and other structural movement, weather exposure, and other conditions of use normally encountered.
   b. Applicable loads and combined loads as required by the California Building Code.

1.5 QUALITY ASSURANCE

A. Submit evidence with the bid confirming the following qualifications:
1. Manufacturer qualifications: Specializing in design and fabrication of modular school building systems of the specific type and quality indicated, in California, for a minimum of 20 years, with evidence of satisfactory completion, including DSA closeout documentation, of minimum of five (5) projects of similar scope and scale within the last five (5) years; Contracted with a California School District for provision of modular school building systems of the specific type and quality.
2. Installer qualifications: Specializing in erection and installation of modular building systems for minimum of 20 years, with evidence of satisfactory completion, including DSA closeout documentation, of minimum of five (5) projects of similar scope and scale within the last five (5) years, approved and certified in writing by the Manufacturer.

B. Inspection and material testing of prefabricated buildings is divided into two separate components: plant inspection and material testing, and onsite inspection and material testing. All inspectors shall be retained by the Owner.

C. All materials used, unless otherwise specified, shall be new and of the types and grades specified. Contractor shall furnish confirming evidence satisfactory to the Architect upon request.

D. All workers, in plant or field, shall be skilled and qualified for the work to be performed.

E. Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a professional structural engineer experienced in design of this Work and licensed in the State of California.
1. Conform to California Building Code (CBC), Title 24 Parts 1 and 2, and DSA

Interpretation of Regulations for submission of design calculations and reviewed shop and erection drawings as required for acquiring DSA approval.

2. Cooperate with inspectors, regulatory and testing agency or authority, and provide data as requested.

F. Perform work in accordance with AISC "Specification for Structural Steel Buildings--Allowable Stress Design, Plastic Design".

G. Perform welding in accordance with AWS D1.1.

H. Pre-Installation Meeting:
1. Convene one (1) week before starting work of this Section.

1.6 WARRANTY

A. Correct defective work within a one (1) year period after Date of Substantial Completion.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver prefabricated components, materials, and manufactured items undamaged. Package, wrap, or provide temporary coverings to protect elements from transportation damage.

B. Acceptance at Site: Inspect work as it is delivered. Reject work exhibiting damage and provide new undamaged work. Reject work not accompanied with the in-plant inspector's certificate.

C. Protect delivered work from weather and related construction operations, including those of other contracts. Maintain work in undamaged condition until erection and placement.

D. Handle work with care. Avoid damage during delivery, erection, and placement.

E. Replace all damaged work prior to installation. Do not install damaged work or materials.

F. Refer to related sections for additional specific requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Modular Buildings:
1. Meehleis Modular Buildings, Inc., www.meehleis.com.

B. Substitutions: See Section 01 60 00: Product Requirements. Substitutions are subject to compliance with qualifications specified in the Quality Assurance paragraphs of this Section.

2.2 MATERIALS

A. As specified herein and elsewhere in the Contract Documents, and as required by referenced codes and standards.

2.3 MANUFACTURED UNITS - GENERAL

A. Modular or Panelized Buildings: Complete, as indicated and specified, conforming to architectural design and appearance indicated, constructed of modules or panels comprising exterior walls and roofs as shown. All wall and roof joints watertight and weatherproof. Design to withstand structural loading as required by DSA.

B. Meet all requirements of Title 24 Parts 1 and 2, and Division of the State Architect Interpretation of Regulations. All areas and portions of the Project shall be fully accessible, complying with Chapter 11 of California Building Code and enforcement comments of DSA Access Compliance review.

C. Design buildings to conform to architectural design and appearance indicated. Select components and design systems to provide functions and amenities indicated, as well as those that are required by the prevailing codes and agencies having jurisdiction, whether or not shown in the Contract Documents.

D. In the event of conflicts, recommend mode of resolution requiring minimum revision to indicated design concept and request direction from Architect. Do not revise or modify design concepts without written acceptance of Architect.

E. The modular building manufacturer’s term contract is the minimum scope of work or level of quality to be provided. In event of conflict between the term contract and the Contract Documents including this Specification, the greater scope or higher quality as specified in the Contract Documents including this Specification shall govern.

F. Dimensions and Tolerances: Minimum ceiling height is eight feet (8'-0"). Plan dimensions indicated may vary within tolerances of plus or minus three inches (3”) to allow flexibility in module or panelization layouts. Clearly indicate all deviations from indicated dimensions or pitches on shop drawings and request specific review from Architect in writing.

G. Design buildings to be transportable over highways to the Project site if transportation of components is necessary. Identify potential design conflicts with maximum transportable sizes. Recommend mode of conflict resolution and request direction from Architect. Do not construct buildings or components that cannot be transported.

2.4 FOUNDATIONS, FLOORS-ON-GRADE, SUBSTRUCTURE

A. Field Engineering: Provide surveying and field engineering services as necessary. Locate buildings, utilities, site features and construction, and establish elevations and grades from identified benchmarks.

B. Slab-on-Grade Floor System:
1. Design and provide permanent concrete slab-on-grade system that meets the recommendations of geotechnical reports.
2. Design slabs and structural cross sections to fit within subgrade elevations and finish floor elevations indicated. Select concrete mix designs and reinforcement to provide structural values required within dimensional constraints indicated. Perform all additional subgrade excavation required to provide for thicker structural sections as designed by Contractor‘s Engineer.
3. Contractor's Engineer is responsible for design of slab-on-grade floor systems in accordance with recommendations of geotechnical reports referenced as related documents.
4. Select and provide vapor barrier system, topical vapor transmission coating, or concrete mix design to ensure that moisture transmission through concrete slab remains below minimum recommended levels of specified floor coverings. All floor

slabs shall be acceptable substrates for specified floor coverings, enabling provision of full manufacturer's warranties for floor coverings.

2.5 SUPERSTRUCTURE

A. Steel Frame: Two-dimensional moment resisting steel frame with bolted or welded connections or shear wall structure.

B. Provide clear span construction free of interior columns or pilasters.

2.6 ROOF STRUCTURE

A. Roof Structure: Steel beams and purlins, corrugated metal roof deck/shear diaphragm.

B. Roof Slope shall be minimum one and a half (1/2") per foot as required by roofing manufacturer to comply with warranty requirements.

C. Roof Overhang: All overhangs shall present a pleasing and finished appearance. Soffits shall be enclosed with plywood without visible framing or protruding fasteners. Plywood soffit material shall be applied with long direction running parallel to the length of the building. Soffits shall be neatly and closely fitted and trimmed without gaps.

D. Ventilation: All enclosed attic and soffit areas shall be ventilated per the referenced codes. Provide venting at locations selected by manufacturer to provide minimum cross-sectional free area stipulated by code. Avoid conflict with other building elements. Show supporting calculations and vent type(s) and locations on shop drawings.

E. Draft Stopping: Enclosed attic and soffit areas shall be draft stopped with durable panel materials per the referenced codes. Provide draft stops at locations selected by manufacturer to reduce attic and soffit areas to the maximum sizes stipulated by code. Show supporting calculations and draft stop locations on shop drawings. Coordinate design of draft stopping with requirements for attic ventilation to ensure that all enclosed areas are properly ventilated.

2.7 EXTERIOR ENCLOSURE

A. Exterior Walls: Wall framing shall be 2x6 wood stud, minimum, and greater as determined by Contractor’s structural engineering review to meet requirements of prevailing codes.

B. Watertight and Weatherproof:
1. Provide complete metal and flexible flashings and trim for watertight and weatherproof construction. Design building envelope flashing systems in accordance with SMACNA standards.
2. All weather-exposed surfaces shall have a weather-resistive barrier equivalent to two (2) layers of Grade D kraft waterproof building paper conforming to ABC, Title 24, Part 2 for asphalt-saturated rag felt. Barrier shall be free from holes and breaks other than those created by fasteners and construction systems for attachment of the building paper and shall be applied over studs or sheathing of all exterior walls. Such barrier shall be applied weather-board fashion, lapped, and wrapped at corners as specified.
3. Provide sheet metal flashings separating concrete from structure at all perimeter locations.

C. Exterior plaster: Three-part portland cement plaster, field-applied, with integral color finish coat. Color to be selected by Architect. Include all screeds, drips, and control joints. Provide

and install reveals as shown.

D. Insulation:
1. Walls shall have an insulation rating of R-21 minimum.
2. Roof shall have an insulation rating of R-38 minimum. Insulation shall be designed to ensure there is no condensation on interior surface of the corrugated metal roof deck.
3. Insulation vapor barrier shall be installed to the heated side. Provide type FSK barrier where located above suspended ceilings.

E. Doors and Hollow Metal Frames:
1. Exterior Doors: Flush doors, minimum dimensions three feet by seven feet by 1-3/4 inch (3'-0" x 7'-0", 1-3/4") thick, 18-guage, with steel face sheets and fire-resistive cores. Factory prepare and reinforce for indicated finish hardware, including reinforcement on both faces for closers.
2. Interior Doors: Flush doors, minimum dimensions three feet by seven feet by 1-3/4 inch (3'-0" x 7'-0", 1-3/4") thick, with maple veneer face sheets and fire-resistive cores. Finish doors with clear sanding sealer finish. Factory prepare and reinforce for indicated finish hardware, including reinforcement on both faces for closers.
3. Hollow metal frames shall be 16-guage at exterior openings and 18-guage at interior openings, depth to suit wall thickness. Jamb throats shall capture all wall cheating panels or materials. Do not permit paneled finishes butted to door frames returns. Provide three (3) anchors minimum per jamb and adjustable floor anchor at bottom of each jamb. Prepare and reinforce for specified and required hardware, including strike box and reinforcement for closers on all frames.
4. Sound-deaden concealed faces with 1/8-inch thick undercoating or fill metal door frame cavity with insulation to attain the sound-deadening requirement. Chemically treat doors and frames for paint adhesion and apply one (1) complete shop coat of metal primer, prepared for field finish specified elsewhere.
5. Design, coordinate, and install door and frame systems with other related work for complete waterproof and watertight systems without conflict or omission in weatherproof enclosures.

F. Windows:
1. Provide thermally broken aluminum nail-fin type windows in configuration shown on the Drawings. Provide operable sections as indicated.
2. Glazing: Provide dual pane insulated glazing with a low-e coating.
3. Exterior side of window openings in plaster walls shall self-trim into the plaster.
4. Interior side of window openings shall be completely cased with solid wood trim, opaque finish. Windows located or sized so that sill heights are seven feet (7’) or more above floor elevation may be self-trimmed by the wallboard only.
5. Header: Typical window header height shall be the same as the door, unless otherwise shown.
6. Design, coordinate, and install window systems with other related work for complete waterproof and watertight systems without conflict or omission in weatherproof enclosures.

G. Hardware - Exterior Doors and Interior Doors: See Section 08 71 00: Door Hardware guidelines.

H. Painting: Paint all exposed surfaces, including cement plaster.

2.8 ROOFING

A. Design, coordinate, and install roofing systems with other related work.

B. Flashing, Gutters, Trim, and Seismic Joints: Provide complete flashing and trim for watertight and weatherproof construction. All roof drainage diverted to roof drains and drained into downspouts extending to below grade storm drain system.

C. Rain Drainage Work: Downspouts with any part located eight feet (8') or less above finish exterior grade shall be 16 gauge welded steel steel pipe construction and brackets. All downspouts extending to finish exterior grade shall be connected to underground storm drain system.

2.9 INTERIOR CONSTRUCTION

A. Partition and demising 2x6 wood stud, minimum, and greater as determined by Contractor's structural engineer to meet requirements of prevailing codes.

B. Sound Attenuation: All interior partitions shall be provided with fiberglass sound insulation and acoustical sealant at top, bottom, and all openings to create a partition with a Sound Transmission Class (STC) rating of 45 or higher. All interior partitions shall extend full height to the underside of the roof deck.

C. Flooring/Base:
1. Provide four-inch (4") high resilient base, coved at resilient flooring and straight type at carpeting, at floor-to-wall junctions and cabinet bases.
2. Carpet: Tandus Powerbond. Style to be Infinity and color to be selected by Architect from manufacturer's standard range. Install per manufacturer's instructions.
3. Resilient Flooring:
   a. Base bid - Linoleum Tile, 12 inches square:
      1) Armstrong, Marmorette. Color as selected by Architect.
      2) Contractor to allow for two (2) accent colors to be incorporated into a tile pattern.

D. Interior Wall Finishes:
1. All walls shall be covered with gypsum wallboard. Gypsum wallboard not concealed by other finishes shall be finished, textured, and painted.
2. Tackwall: Walls shall be covered with vinyl covered tackboard applied without horizontal joints. Vertical joints shall be covered with manufacturer's standard pre-finished joint cover splines matching vinyl color.
3. Provide an additional layer of gypsum wallboard at locations where FRP wall panels abut vinyl covered tackboard wall panels to provide flush finish transitions between the two materials.

E. Ceiling:
1. Typical ceiling system shall be suspended ceiling system, minimum classification of Heavy Duty per ASTM C635. Grid shall be direct hung in strict accordance with CBC Title 24, Part 2 and DSA IR #25-2.10.
2. Typical acoustical panels shall be 5/8-inch minimum thick, mineral fiberboard, or vinyl-faced fiberglass lay-in panels, square edge, ASTM flame-spread index Class I (O-25), 24 inches by 48 inches modular size, light reflection 75 percent minimum, noise reduction coefficient of 0.65 minimum.

F. Painting: Paint all exposed surfaces that are not factory finished.

2.10 PLUMBING

A. Contractor shall design and provide a complete plumbing system comprising of:

1. Domestic hot and cold water piping systems.
2. Drain, waste, and vent piping systems.
3. Gas piping system.
4. Plumbing fixtures and trim.
5. Gas and water shut-off valves capable of isolating building systems from site systems.

B. All equipment and systems must comply with California Plumbing Code and Title 24 energy use standards.

C. All piping shall be concealed within the building structure or within chases.

D. Extend piping systems to points-of-connection with site utilities at locations indicated. Provide shut-off valves and grade boxes within the ten-foot (10') perimeter of the building. Provide clean-outs in locations required by California Plumbing Code. Coordinate with site work contractor to bring clean-outs and grade boxes to finish grade.

E. Size piping on the basis of fixture or appliance demand and conforming to California Plumbing Code. Provide shut-off and isolation valves to permit maintenance and repair without undue interruption of service to other units. Install piping to prevent damage to structure or pipe supports from thermal expansion or contraction of piping systems.

F. Route and install piping systems to avoid conflicts with structure while remaining concealed. Provide chases, furring or enlarged framing to allow piping to pass around structural framing without exceeding code-imposed limits on openings allowed in framing.

2.11 HEATING, VENTILATING, AIR CONDITIONING

A. Contractor shall design and provide a complete HVAC system comprising of:
1. Forced air unit, located in mechanical closet.
2. Ductwork, registers, and air diffusers.
3. Controls.
4. Testing and balancing ventilation system.

B. Reference Brand Carrier, or equal. Air fillers shall be two inches (2") thick pleated media, disposable type. Filters shall be 30 percent efficient per ASHRAE standard 52.

C. The mechanical ventilation system shall provide a minimum of 15 cubic feet of outside air per minute per occupant, with one (1) occupant per 20 square feet of floor area.

D. The system shall maintain an automatically controlled indoor classroom temperature of 75 degrees F in summer and 70 degrees F in winter with a 40-60 percent relative humidity when the outdoor temperature varies between 98 degrees F dry bulb (69 degrees F wet bulb) and 28 degrees F dry bulb.

E. The system must maintain the specified temperatures when providing outside air as indicated.

F. The equipment and systems must comply with California Mechanical Code and Title 24 energy use standards.

G. HVAC equipment electrical characteristics shall suit the site requirements.

H. Ductwork constructed of galvanized sheet metal in accordance with California Mechanical Code, ASHRAE, and SMACNA Low Velocity Duct Construction Manual, latest editions:

1. All ductwork shall be concealed within the building walls, floor, ceiling, or in soffits or chases, unless specifically shown otherwise in the Architect's Drawings. Request specific direction from Architect for re-routing of ductwork or for use of exposed ductwork. All exposed ductwork shall be round spiral-wound material designed and manufactured for exposed locations.
2. Insulate with one-inch (1”) fiberglass duct wrap with vapor barrier, include one-inch (1”) duct attenuation within eight feet (8’) of HVAC unit.
3. Rigid one-inch (1”) fiberglass or insulated “Flex-Duct" conforming to NFPA 90-A, 90 B and SMACNA Class 1 may be substituted for metal ductwork in accessible concealed portions of the duct system.
4. Registers and diffusers: Provide minimum of two (2) four-way air supply diffusers per room, located to provide maximum feasible air distribution. Diffusers shall not be sized larger than 400 cfm each and shall have a NC-30 or less.
5. Ducted return: Provide ducted return air design. Direct-coupled return air registers are not acceptable.

2.12 FIRE PROTECTION

A. Design and provide a complete fire protection system, if required.

B. Owner will conduct a flow test on the existing hydrant and will provide the results upon request.

2.13 ELECTRICAL

A. Design and provide a complete electrical system comprising of:
   1. Line voltage power outlets and distribution and panel boards as required to provide complete operational systems.

B. Provide bonding of all building components to an approved ground as required by DSA IR E-1, such that the resistance to ground is 25 ohms or less. Grounding tests are to be observed and reported by the onsite inspector. Costs of inspection will be provided by the District.

2.14 LIGHTING

A. Design and provide a complete lighting system comprising of:
   1. Interior fixtures of types and quantities indicated and additionally as necessary to meet the following standards:
      a. Selected and spaced to provide minimum overall average illumination of 50-foot candles at desk level (30 inches above floor elevation) and comply with IES recommendations for classroom interiors otherwise.
      b. Exterior fixtures to have translucent vandal-resistant housing with corrosion-resistant metal housing, high-pressure sodium or metal-halide type, securely attached to building structure adjacent to all exterior doors and as otherwise required to provide minimum overall average illumination complying with IES recommendations for exterior walkways.
      c. All lighting in classrooms and small rooms shall be controlled by occupancy sensors.
      d. Exterior lighting shall be controlled by an astronomical timeclock.

2.15 FIRE ALARM AND DETECTION

A. Provide conduit and junction boxes with pull strings for interior and exterior initiation

devices, horn-strobes, terminals, and other devices as shown.

B. Seal conduits and boxes with weatherproof covers and leave in condition for components, wiring, and final connections by sitework contractor.

2.16 SIGNAL, DATA, AND TELECOMMUNICATIONS

A. Provide conduit and junction boxes with pull strings for interior and exterior devices.

B. Telecommunications and signal device locations for rough-ins will be based on site work electrical plans and documents.

C. Seal conduits and boxes with weatherproof covers and leave in condition for components, wiring, and final connections by site work contractor.

2.17 EQUIPMENT AND FURNISHINGS

A. Cabinets and Casework:
   1. Plastic laminate, frameless, custom grade per Woodwork Institute:
      a. Countertops and frames to have plastic laminate surfaces. Colors to be selected by Architect.

B. Marker Boards: Each classroom shall have two (2) eight-foot (8') long LCS Delux series marker boards as manufactured by Claridge or approved equal, located as shown.

C. Television Wall Brackets: One (1) located in the conference room as indicated. Brackets shall be capable to support an 80-inch flat panel television.

D. Fire Extinguishers and Cabinets:
   1. Each exterior door shall be equipped with a pressure type fire extinguisher with 2A-10BC UL rating mounted at a height of four feet (4') on the interior wall near the doorway.

2.18 SITE PREPARATION

A. Site preparation and building pad preparation to be performed by site work contractor.

B. Perform fine grading within perimeter of building foundations prior to permanent placement of buildings; ensure positive drainage to under-building drains.

2.19 SITE SERVICES

A. Certain site service utilities are provided by site work contractor.

B. Contractor to connect site service utilities to modular buildings as follows:
   1. Rain drainage: Contractor to connect building systems to stub-out provided by site work contractor.
   2. Sanitary sewer: Contractor to connect building systems to stub-out provided by site work contractor.
   3. Domestic water: Contractor to connect building systems to stub-out at valve in grade box provided by site work contractor.
   4. Fire water: Contractor to provide post indicator valve and connect building systems to stub-out provided by site work contractor.
   5. Provide conduit and wire to connect P. I.V. tamper switch to new fire alarm panel.

6. Gas: Contractor to connect building systems to stub-out at valve in grade box provided by site work contractor.
7. Electrical power: Contractor to connect conduit raceways from building systems to stub-out provided by site work contractor. Site work contractor shall pull conductors and make final connections inside modular building panel.
8. Clock: Contractor to connect conduit raceways from building systems to stub-out provided by site work contractor. Site work contractor shall pull conductors and provide active devices and terminations and all final connections inside modular building.
9. Bell: Contractor to connect conduit raceways from building systems to stub-out provided by site work contractor. Site work contractor shall pull conductors and provide active devices and terminations and all final connections inside modular building.
10. Intercom/public address: Contractor to connect conduit raceways from building systems to stub-out provided by site work contractor. Site work contractor shall pull conductors, provide active devices and terminations and all final connections inside modular building.
11. Telephone: Contractor to connect conduit raceways from building systems to stub out provided by site work contractor. Site work contractor shall pull conductors and provide active devices and terminations and all final connections inside modular building.
12. Data/fiberoptic: Contractor to connect conduit raceways from building systems to stub-out provided by site work contractor. Site work contractor shall pull conductors and provide active devices and terminations and all final connections inside modular building.
13. Television: Contractor to connect conduit raceways from building systems to stub-out provided by site work contractor. Site work contractor shall pull conductors and provide active devices and terminations and all final connections inside modular building.

2.20 ACCESSORIES

A. Provide complete functional buildings: Design, select, and provide all building elements, incidental fasteners, sealants, components, flashings, and fittings necessary to finish the work complete with all performance characteristics as indicated, specified, and as needed to comply with referenced and prevailing codes.

B. No allowances for additional sums will be made for Contractor's errors, omissions, or failure to design all required conditions in completion of the building design or construction.

2.21 MIXES

A. Concrete, mortar, grout, and other mixes shall be designed by the Contractor’s design professionals in conformance with requirements of the Contract Documents.

2.22 FABRICATION

A. Plant Fabrication Required: Perform building fabrication under factory conditions in a plant designed for this type of work. Provide adequate space, equipment, materials, licensed design services, and technical personnel to fabricate, coordinate, assemble, pack, ship, and install all required building components in controlled conditions.

B. Shop welding shall comply with AWS D1.3 for cold-formed steel. Do not commence welding operations until the welding inspector has inspected and accepted materials, joint preparation, equipment, and qualifications of the operators. Unsatisfactory work shall be removed and replaced with conforming work.

C. Provide for temperature expansion/contraction movement and seismic movement of building

elements. Design and fabricate expansion control in accordance with prevailing codes and Contractor's design calculations.

D. Fabrication testing and inspection shall be performed at the plant.

E. Do not fabricate until materials are tested and accepted. Do not fabricate with untested materials.

F. Framed Openings: Provide openings of shape, size, location, and design to accommodate systems requiring penetrations. Reinforce openings with structural elements sized to resist loads and vibrations imposed, including mechanical and electrical work. Securely attach all framing to structure.

G. Provide for fabrication and wind loads. Provide temporary bracing to maintain work plumb and in alignment until completion of erection and installation of permanent bracing.

H. Select fabrication methods and processes to avoid transmission of erection or fabrication loads to fabricated members. Avoid locking-in stresses.

I. Prepare all work true to indicated shapes and dimensions required. Form all components true to required shape, accurate in size and radius, square, and free from distortion or defects. Cut materials to precise lengths indicated from field measurements.

J. Machine-roll elements required to be curved or radiused. Do not field bend or "walk-down." Provide true curves; segmented fabrication not allowed.

K. Store completed work at the fabrication plant under conditions that will prevent damage or deterioration until work can be transported to the Project site. Repair damage prior to transport. Do not transport damaged or unacceptable work.

L. Do not store completed work at the Project site. Do not transport completed work until Project site is prepared to accept building modules for prompt installation.

2.23 FINISHES

A. Exterior and interior finishes shall be as indicated on the Drawings. Exposed finishes shall be site-applied to the greatest extent feasible.

B. Painting: All exterior and interior finishes shall be painted.

2.24 SOURCE QUALITY CONTROL

A. Inspection: Plant inspection and material testing shall be performed under the supervision of the in-plant inspector. Provide the inspector with full access to all plant operations involving work under this contract. Notify the inspector in advance of the time and place when operations requiring inspection or observation are to take place.

B. Inspector shall inspect all components for acceptability and issue a written certificate. A copy of the signed certificate shall accompany each building to the site. Do not release components from plant without this certificate.

C. Attach to each module or panel a permanent visible tag indicating the date of manufacture, the manufacturer's serial number, and the DSA application number prior to release from plant for delivery.

D. The inspector shall examine the workmanship of each welder prior to incorporation of the individual's welding into the Work. Unsatisfactory welders shall be removed by the inspector and replaced with qualified personnel. Welders so removed shall be required to pass qualification tests before returning to work.

E. Every layer of weld shall be inspected for quality. Each layer of multiple pass welds shall be fully inspected before the succeeding layer is applied. Each joint shall be inspected for conformance with the Contract Documents. Full penetration butt welds shall be made only in the presence of the welding inspector.

F. Single pass welds may be inspected after the welding is completed, except for conditions requiring continuous inspection.

G. The welding inspector shall use all means necessary to determine the quality of the welds.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that civil, mechanical, and electrical utilities are proper types in correct position.

B. Verify building pads and adjacent subgrades are certified elevations, properly compacted and moisture conditioned.

C. Verify that adjacent structures, foundations, and items in related contracts are proper types in correct positions.

3.2 PROJECT CONDITIONS

A. Coordination of Work:
   1. Comply with requirements for coordination specified elsewhere and the following:
      a. Make all necessary arrangements with the School District's authorized representative and other separate contractors for access to grounds, removal of obstructions, and preparation of delivery routes. This contact shall be made at least 48 hours in advance of delivery of any module, building component, equipment, or material.

B. Visit the site to verify readiness to receive building modules, components, or equipment. If work is delivered before site is prepared to receive it, Contractor shall be responsible for all costs incurred including, but not limited to, inspector's time and costs accruing to separate contractors or others for accommodating this out-of-sequence work.

C. Continuously coordinate this work with that of separate contractors. Attend progress meetings of separate contractors, cooperate with separate contractors, provide and request all data concerning schedules, access, storage and handling, and all such other information as requested or necessary to fully complete the work, free of conflicts or omissions.

3.3 INTERFACE WITH OTHER WORK

A. Coordinate the modular building erection and installation with other contracts. Ensure construction of complete and functional systems, free of conflict or omission. Allow access to other contracts to complete work related to this contract.

3.4 SEQUENCING

A. Sequence the work to coordinate with the activities of separate contractors and specific sequences as indicated or implied.

B. Sequence work to avoid interference with adjacent construction.

C. Request or provide information concerning activities of this contract or separate contracts to enable efficient sequencing.

3.5 SCHEDULING

A. Schedule the work to achieve Contract milestones and completion dates indicated.

B. Deliver and install buildings to ensure that Project is completed on schedule. Calculate costs of weekend, overtime, or premium time work to accomplish the schedule and include these costs in the bid.

3.6 TRANSPORTING AND STORAGE

A. Transport prefabricated components from fabrication plant to Project site.

B. Coordinate component delivery in time for erection in intended locations. Do not store components onsite prior to completion of foundations or site preparation.

3.7 ERECTION - FOUNDATIONS AND SLABS

A. General: Verify elevations and perform excavation required for foundations, footings, etc. prior to installation of foundation materials. Conform to DSA foundation and slab requirements.

B. Prepare formwork, embedment’s, and reinforcements and place concrete as specified by Contractor’s engineer.

C. Finish, cure, and patch concrete as specified by Contractor’s engineer.

3.8 ERECTION - GENERAL

A. Erection shall be performed by personnel experienced in the delivery and erection of modular and relocatable structures. All building joints shall be capable of being rigidly connected in order to maintain positive alignment of floors, walls, and roofs.

B. Verify that floor slab and placed anchors are in correct position.

C. All work shall be installed plumb, level, true to line and plane, in strict conformance with the DSA approved shop drawings, and as specified by Contractor’s engineer.

D. Erect framing in accordance with AISC Specification for Structural Steel Buildings.

E. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.

F. Set column base plates with non-shrink grout to achieve full plate bearing.

G. Do not field cut or alter structural members without approval.

H. Install bolts as indicated on shop drawings. Provide washers under all nuts. Draw up all nuts tightly. Install high-strength bolting in accordance with prevailing code.

I. After erection, prime welds, abrasions, and surfaces not shop primed.

3.9 INSTALLATION - ACCESSORIES

A. Install components and accessories as specified in their respective Sections and in accordance with manufacturer’s instructions.

B. Install trims and finishes neatly, free of gaps, holes, cut edges, frays, or ravels. Conceal fasteners wherever possible.

C. Seal wall and roof accessories watertight and weather tight with sealant.

3.10 FIELD QUALITY CONTROL

A. Onsite inspection shall be performed by the Owner's site inspector. All work performed at the site shall be subject to the inspection of the site inspector. Inform the site inspector as to progress of work and dates when site work will occur.

B. Coordinate inspections with those required for other contracts, to the greatest extent feasible.

C. Grounding tests of building electrical systems are to be observed and reported by the onsite inspector. Costs of inspection will be provided by the District.

3.11 TOLERANCES

A. Framing Members: 1/8 inch from level; 1/8 inch in ten feet (10’) non-cumulative, from plumb.

B. Siding and Roofing: 1/8 inch from true position.

C. Other Elements. As specified in the respective related Sections.

3.12 PROTECTION

A. Repair or replace damaged work prior to acceptance.

3.13 ADJUSTING AND CLEANING

A. Prior to Architect's punch list, adjust work for complete and functional operation and appearance.

B. Following punch list, perform all adjustments as noted by the Architect and maintain the work in this condition until acceptance by the Owner.

3.14 DEMONSTRATION

A. Demonstrate proper operation of all building elements and features to Architect and Owner.

3.15 MAINTENANCE

A. Provide extra materials for Owner's use in maintenance as specified in the pertinent related

Sections.

B. Fasteners and Connectors: Provide minimum five percent (5%) additional fasteners over the amount required for each connection of each module and panel of building component. Pack, label, and identify fasteners for intended use and store on the site in a mutually accepted, secure location. Deliver these surplus fasteners prior to the delivery of building modules to the site.

END OF SECTION 13 34 23

Responsibility Matrix Lodi Unified School District – Davis Elementary School				
Description	**Site Contractor**	**Modular Contractor**	**Others**	**Comments**
Division 01 – General Requirements:				
All Work Within the Perimeter of the Modular Building		X		Low voltage, design, and installation.
All Work Outside the Perimeter of the Modular Buildings Not Specifically Identified Below	X			
Full-Time Supervision for Crew Onsite		X		Factory Trained Crew
Temporary Facilities:				
Temporary Site Fencing	X			
Field Office for Inspector and CM	X			Optional field office and Space.
Temporary Power Service	X			
Gas and Electrical Utility Charge for Start-Up and Testing	X			
Temporary Water	X			
Temporary Fire Water	X			
Division 02 – Existing Conditions:				
Site Demo and Excavation	X			
Rough Grading	X			
Finish Grading and Re-Grading After the Form Work is Removed by the Modular Contractor	X			Modular Contractor to coordinate ALL utilities hook-up with Site Contractor
Site Fencing	X			
Asphalt Concrete:				
Driveways/Parking	X			
Walkways	X			
Striping	X			

Description	Site Contractor	Modular Contractor	Others	Comments
Site Concrete:				
Mow Strips	X			
Site Flat Work	X			Modular Contractor to coordinate with Site Contractor for placement of stairs and Ramps, including bottom of ramp/stair accessible pads.
Curb and Gutter	X			
Condenser Pads (if applicable)		X		Modular Contractor to coordinate with Site Contractor for placement.
Storm Drains:				
Site	X			
Storm Drain to RWL	X			
Connect RWL to SD	X			
Gas Service:				
Gas Service to Meter Incl. Trenching	X			
Gas Service to Meter	X			
Gas Meter	X			
Gas Line to Buildings	X			
Housekeeping Pad for Gas Meter (if applicable)	X			
Regulator at Buildings	X			
SOV at Buildings		X		
Domestic Water:				
Water Service to Meter Inc. Trenching	X			
Water Service to Meter	X			
Water Service (within 5' of buildings)		X		
SOV at Buildings		X		
Connect to Buildings		X		

Chlorination – Site Lines	X			
Description	**Site Contractor**	**Modular Contractor**	**Others**	**Comments**
Chlorination – Building Lines		X		
Sanitary Sewer:				
Site to POC (within 5' of building)	X			
Cleanouts at POC	X			
Connections at Building		X		
Division 03 – Concrete:				
Building Slab:				
Design (Geotech Report by Others)		X		
Over-Excavation and Pad Prep with Certified Pad	X			
Surveying and Foundation Staking	X			
Dig Footings		X		
Off-Haul Footing Spoils		X		
Footings and Required Stem Walls		X		
Building Slab-on-Grade		X		
Retaining Walls	X			
Division 05 – Metals:				
Design		X		
Steel Framing		X		
Stair Structures (if applicable)				N/A
DI Grates	X			
DF Rails on New Building				N/A
DF Rails at Site DFs	X			
Canopies, Trellis'	X			
Division 06 – Wood, Plastics, and Composites:				
Wall Framing		X		
Building Insulation		X		
Interior Trim		X		

Wood Siding (if applicable)				N/A
Description	**Site Contractor**	**Modular Contractor**	**Others**	**Comments**
Division 07 – Thermal and Moisture Protection:				
Roofing:		X		
Gutters and Downspouts		X		
Roof Drains/Scuppers		X		Modular Contractor to coordinate with Site Contractor for placement
Division 08 – Openings:				
Doors		X		
Windows		X		
Storefront/Curtain Walls (if required)		X		
Skylights (Solatubes)				N/A
Roll-Up Doors				N/A
Classroom Partitions				N/A
Division 09 – Finishes:				
Acoustic Ceilings		X		
Drywall		X		
Ceramic Tile (if required)				N/A
FRP Wall Finish (if required)				N/A
Lath and Plaster (if required)		X		
Wood or Hardie Siding (if required)				N/A
Tackboard (if required)		X		
Flooring – Carpet/VCT/Lino		X		
Finish Painting		X		
Painted Mascot and Logos on Buildings				N/A
Division 10 – Specialties:				
Monument Signage				N/A
Site Sunshades	X			

Toilet Partitions				N/A
Toilet Accessories				N/A
Building Fire Extinguishers		X		
Description	**Site Contractor**	**Modular Contractor**	**Others**	**Comments**
Building ID and ADA Signage	X			
Division 11 – Equipment:				
Food Service Equipment				N/A
Projection Screens				N/A
Laboratory Equipment				Coordinate with Site Contractor for acid pipe connection and disposal. N/A
Division 12 – Furnishings:				
Casework and Countertops		X		
Window Coverings (if required)		X		
Furniture			X	
Division 13 – Special Construction:				
Modular Buildings:				
Design and Engineering, Structural, and MEP		X		
Manufacture Buildings		X		
Deliver, Set, and Connect		X		
All Finishes		X		
Elevator (if required)				
Division 23 – Heating, Ventilating, and Air Conditioning (HVAC):				
Design		X		
HVAC Equipment		X		
All Building Plumbing and Trim		X		
Condensate Drain and Drywell		X		
Drinking Fountains at Modular				N/A

Buildings				
Drinking Fountains Not Attached to Buildings	X			
Description	**Site Contractor**	**Modular Contractor**	**Others**	**Comments**
Energy Management System/BMS	X			
Fire Sprinkler Design (if required)				N/A
Fire Sprinkler System (if required)				N/A
Fire Service – Underground to Above Floor	X			
Fire Riser				N/A
Flow and Tamper Switches		X		
Site Hydrants	X			Coordinate with local Fire Dept for hydrant Testing.
Division 26 – Electrical:				
Design – Power and Lighting		X		
Transformers in Building (if required)		X		
MDP in Building		X		
Subpanels in Building		X		
Power Feeders to Buildings	X			Coordinate with Modular Contractor.
Power in Building, Plugs/Switches		X		
Lighting		X		
Grounding, Install and Test		X		
Site Power and Lighting	X			
Integration and Networking to BMS	X			
Solar System/Array	X			
Telephone/Telecom Systems:				
Design		X		
Empty Conduit and Back Boxes in Building		X		
Conduit to Building		X		

Telephone System and Testing		X		
Description	**Site Contractor**	**Modular Contractor**	**Others**	**Comments**
Data:				
Design		X		
Empty Conduit and Back Boxes in Building		X		
Conduit to Building		X		
Data Equipment and Cabling		X		
IDF Cabinet		X		
Power for IDF		X		
Clock/Bell/Intercom:				
Design		X		
Empty Conduit and Back Boxes in Building		X		
Conduit to Building		X		
Equipment and Cabling		X		
AV Systems:				
Design		X		
Classroom Projector and Mounts		X		
Classroom AV System		X		
Power for Classroom Projectors		X		
Fire Alarm:				
Design		X		
Empty Conduit and Back Boxes in Building		X		
Conduit to Building		X		
All Fire Alarm Control and Annunciator Panels				
Power for FACP/FAEP (in modular buildings)		X		
FACP/FAEP		X		
Security System:				
Design		X		

Empty Conduit and Back Boxes in Building		X		
Description	**Site Contractor**	**Modular Contractor**	**Others**	**Comments**
Conduit to Building		X		
Cameras and Equipment		X		

SECTION 13 34 23.02 MECHANICAL NARRATIVE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Related Documents:
1. Review all contract documents thoroughly prior to bid.
2. Section 13 34 23: Pre-Engineered Modular Buildings
3. Section 13 34 23.01: Pre-Engineered Modular Building – Matrix (Responsibility Matrix – Lodi Unified School District – Davis Elementary School Site)
4. Section 13 34 23.03: Electrical Narrative.
5. Products listed are from the District Standards.

1.2 SUMMARY

A. Comply with the following design and construction guides/standards:
1. SMACNA: Related to duct construction, support and bracing for all ductwork and piping, seismic bracing, and vibration isolation.
2. ASHRAE 62.1: Ventilation.
3. ASHRAE 55: Thermal comfort design.
4. AABC and NEBB: Testing, Adjusting and Balancing

B. Project Scope:
1. Classrooms to be served by packaged rooftop Heat Pump units, ducted to each space with an overhead mixed air distribution system. Packaged rooftop Heat Pump HVAC is proposed for most of the open building spaces. Lennox provides a high efficiency rooftop unit available with SEER'S of 15-17; with power exhaust economizers to utilize free cooling for this climate. CO2 monitors will be used for high occupancy spaces such as the Classrooms, and Open Areas to limit excess outside air when the space is operating at less than design occupancy. These units may also be able to be utilized as a single zone variable volume unit for additional energy savings.

C. Design Criteria:
1. All load calculations shall be completed using computer load simulation software (Trace 700, HAP or equal). The following shall be the conditions.
   a. Summer: 105 F dry bulb; 70 F wet bulb
   b. Winter: 23 F dry bulb
   c. Altitude: 49 ft
   d. Indoor Design Conditions: 72 F at 50% RH

D. Internal Load Assumptions: The following internal load assumptions shall be made in the load calculations:
1. Classroom Space:
   a. Equipment/Miscellaneous Load: 1.0 watts/SF
   b. Lighting Load: 1.2 watts/SF
   c. Occupant Load: Per ASHRAE and Title 24
   d. Ventilation: Per Title 24

E. E. HVAC Equipment:

1. Coordinate equipment locations and sizes with the architect.
2. HVAC Units: Serving Classrooms.
   a. System type: Small (4-5 ton) high efficiency packaged heat pumped, DX cooling rooftop units.
   b. MERV 13 filters.
   c. Single-zone variable air volume.
   d. Carrier or Equal.

F. Ductwork and Air Distribution:
1. All ductwork shall meet SMACNA standards for construction and support.
2. The system shall be overhead exposed ducted supply and return.
3. Main ductwork shall be sized with a maximum of 1,200 FPM and 0.08” w.c. per 100 ft.
4. Ductwork shall be designed and constructed to limit losses due to fittings.
5. Acoustic flexible ductwork shall be limited to 5 feet length at individual runouts to diffusers/grilles.
6. Exposed ductwork shall be spiral duct.

G. Energy Management System:
1. New energy management system shall be Pelican to match District Standards.
2. EMS system shall be coordinated with District’s IT personnel.
3. EMS shall be capable the following at a minimum:
   a. trending, monitor/alarm, scheduling, setting and adjusting setpoints and optimum start and stop strategies.

H. TAB & Commissioning:
1. Provide factory startup for all HVAC equipment.
2. The HVAC systems shall be tested and balance by a qualified third party test and balance company. TAB company shall be certified by NEBB and/or AABC.
3. The mechanical contractor and TAB company shall cooperate fully with the Commissioning Agent to perform all necessary tests and retests.
4. The mechanical contractor shall complete the pre-functional and functional checklists to be included in the commissioning report.
5. Mechanical contractor shall submit all Sequences of Operation to the Commissioning agent.
6. The mechanical contractor shall address to the owner’s satisfaction any and all items identified in the issues log as part of the commissioning process.

END OF SECTION 13 34 23.02

SECTION 13 34 23.03 ELECTRICAL NARRATIVE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Related Documents:
1. Review all contract documents thoroughly prior to bid.
2. Section 13 34 23: Pre-Engineered Modular Buildings
3. Section 13 34 23.01: Pre-Engineered Modular Building – Matrix (Responsibility Matrix – Natomas Unified School District – NP3 Elementary School Site)
4. Section 13 34 23.02: Mechanical Narrative.
5. Products listed are from the District Standards.

1.2 SUMMARY

A. Work included: Basic Electrical Requirements:
1. Work specified in this Section encompasses products, assemblies, and basic installation methods required for electrical project systems specified under this Division and includes, but is not limited to:
   a. Power distribution system.
   b. Interior building lighting systems including controls.
   c. Egress lighting system.
   d. Exterior building and landscape lighting systems including controls.
   e. Lighting system branch circuiting.
   f. Telecommunication raceway distribution system.
   g. Security raceway distribution system and power for equipment.
   h. Power wiring and service connections to HVAC and plumbing equipment, etc.
   i. Wiring devices and branch circuiting for convenience outlets in building.

B. Work included: Basic Electrical Material and Methods:
1. Work specified in this Section encompasses products, assemblies, and basic installation methods required for electrical project systems specified under this Division and includes, but is not limited to:
   a. Raceways.
   b. Wires and cables.
   c. Outlet, pull, and junction boxes.
   d. Wiring devices.
   e. Cabinets and enclosures.
   f. Grounding and bonding.
   g. Supporting devices.
   h. Electrical identification

C. Work included: Distribution Switchgear:
1. Work specified in this Section encompasses major components of switchgear required for electrical distribution system specified under this Division and includes, but is not limited to:
   a. Main service switchboard and distribution switchboards, including accessories.
   b. Disconnect switches.
   c. Panelboards.

d. Overcurrent protection devices.
e. Transformers.

D. Work included: Lighting:
1. Provide complete normal and egress lighting system consisting of fixtures, LED drivers, and controls.

E. Work excluded:
1. The following items of work or equipment will be provided under another construction contract, i.e., not in the electrical contract:
a. Sprinkler flow switches and valve monitors (fire protection).
b. Package starter units or integral VFD drives for AC equipment (mechanical).
c. Temperature control wiring for HVAC system (mechanical).
d. Fire/smoke dampers (mechanical).
e. Irrigation controllers and low voltage wiring for control valves (landscape).
f. Door hold open/release devices (hardware).
g. Electric locks for door control (hardware).
h. Telecommunication cabling and devices (Division 27).
i. Security system and devices (Division 28).

F. Reference Standards:
1. Work shall be performed in accordance with all applicable requirements of the latest edition of governing codes, rules, and regulations, including but not limited to the following minimum standards:
a. CEC California Building Standards Code, Part 3, California Electric Code.
b. CBC California Building Standards Code, Part 2, Basic Building Regulations.
c. CCR California Code of Regulations, Title 24.
d. UBC Uniform Building Code.
e. UFC Uniform Fire Code.
f. UMC Uniform Mechanical Code.
2. Equipment and materials shall conform to the following standards where applicable:
a. ACI American Concrete Institute.
b. ANSI American National Standards Institute.
c. ASTM American Society for Testing Materials.
d. CBM Certified Ballast Manufacturers.
e. ETL Electrical Testing Laboratories.
f. FS Federal Specification.
g. IEEE Institute of Electrical and Electronics Engineers, Inc.
h. IPCEA Insulated Power Cable Engineer Association.
i. NEMA National Electrical Manufacturer’s Association.
j. UL Underwriter’s Laboratories.

G. Related Work:
1. Miscellaneous metal work: Include fittings, brackets, supports, welding, and pipe as required for raceway and device support and seismic bracing; refer to Division 05.
2. Moisture protection: Include membrane clamps, sheet metal flashing, caulking and sealants, and vapor barriers as required for waterproofing of conduit penetrations through walls and roof; refer to Division 07.

1.3 SUBMITTALS

A. Project Record Documents: Provide Project Record Drawings as required herein. Such Drawings shall fully represent installed conditions including actual location of outlets, true panelboard connections following phase balancing routines, correct conduit and wire sizing, as well as routing, revised fixture schedule listing the manufacturer and products actually

installed, and revised panel schedules. A set of DXF files of the electrical drawings will be provided to the Contractor for their use in preparing Record Drawings via an AutoCAD system.

1.4 QUALITY ASSURANCE

A. Testing:
   1. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these Specifications. Tests shall be performed in the presence of the engineer and shall include, but not be limited to, the following:
      a. Insulation resistance: Perform 600-volt DC tests for one (1) minute on all equipment rated 300 volts and higher, feeder and branch circuit conductors, including the neutral.
      b. Circuit continuity: Test all feeder and branch circuits for continuity. Test all neutrals for improper grounds.
      c. Equipment operations: Test motors for correct operation and rotation.
      d. Lighting control circuits: Perform operation tests for all lighting circuits controlled.

B. Seismic Bracing: All electrical components shall be installed and braced to conform with California Administrative Codes, Title 21, Title 24 and the Uniform Building Code for Seismic Zone 4.

PART 2 PRODUCTS

2.1 RACEWAYS

A. Minimum conduit size for in-wall and underground applications shall be 0.75 inch. Home run conduits shall be sized to maximum 30 percent fill.

B. Rigid steel conduit (GRS): May be used for feeders and branch circuits, run, exposed on roof.

C. PVC insulated rigid steel conduit (PVC GRS) may be used in the following locations:
   1. For feeders and branch circuits in damp or wet locations and where exposed on exterior building walls or roofs.
   2. For feeders and branch circuits concealed in concrete walls or slabs in contact with earth.
   3. For all below grade penetrations through floor slabs or walls.
   4. At transitions from underground PVC when rising up above grade in exposed areas and at utility entrances, use PVC GRS elbows and riser.

D. Intermediate metal conduit (IMC) may be used for the same application as rigid steel conduit.

E. Electrical metallic tubing (EMT) may be used for electrical feeders, interior power and lighting branch circuits, and low tension (telephone and signal) distribution system where run concealed above suspended ceilings, in concrete slabs not in contact with earth, in stud walls, furred spaces, and crawl spaces. All fittings and connectors shall be galvanized steel.

F. Rigid non-metallic conduit (PVC) may be used for any of the following:
   1. For feeders and branch circuits run beneath ground floor slab except that bends and penetrations through the floor must be PVC coated rigid steel.
   2. For exterior branch circuits in planters and directly buried in earth, 18 inches minimum

below grade.
3. PVC may not be run exposed or in concrete walls.
4. Electrical service entrance conduits and telephone service entrance conduits (except that bends must be rigid steel) may be direct burial PVC conduit, 36 inches minimum below grade.

G. Flexible metallic conduit (FMC) may be used in dry locations for connections from adjacent outlet boxes to motors, transformers, vibrating equipment and machinery, and to lighting fixtures installed in suspended ceilings; minimum sizes shall be 3/8 inch for lighting fixtures and control wiring and 1/2 inch for motor and transformer connections.

H. Liquidtight flexible metallic conduit (LFMC) may be used in damp and wet locations for the same applications as for FMC specified under this Section. Connections to all pump motors, solenoid valves, float switches, flow switches, and similar devices shall be made using liquidtight flexible metallic conduit. Minimum sizes shall be 3/8 inch for lighting fixtures and control wiring and 1/2 inch for motor and transformer connections.

I. Cable tray: Cable tray shall be ladder or solid-bottom type as indicated. Furnish complete to include tray, cover, accessories, fittings, and supports as required. Cable tray shall be NEMA VE 1. Tray and accessories shall be constructed of galvanized steel all welded construction with `C' shaped side rails. Splice plates shall be high strength to allow random location between support members. Supports shall be of the trapeze type and shall be installed on six-foot (6') centers. Cable Tray shall be 12 inches wide with a depth of four inches (4”). Tray shall have 18-inch sweeps.

2.2 WIRE AND CABLE

A. Building Wire:
1. Provide insulated copper conductors for all wires and cables. Use stranded conductors for wire size #8 and greater.
2. Provide minimum AWG #12 for all power and lighting branch circuits. Provide #10 neutral conductor for circuits where two (2) or more phase conductors share a neutral.
3. Use NEC Type THW, THWN, or Type XHHW for feeders and branch circuits in wet or dry locations. Use NEC type THHN for branch circuits in dry locations.
4. Use NEC Type XHHW, rated 90 degrees C in dry locations and 75 degrees C in wet locations, for exterior branch circuit wiring and for circuits served by ground fault interrupting circuit breakers.

B. MC Cable:
1. MC cable shall be an armored assembly of two (2) or more dual rated THHN/THWN conductors and a full sized green insulated ground wire. All conductors shall be stranded. Conductors shall be color-coded for the correct phase and voltage as specified herein. Connectors shall be of the single screw clamp variety with steel or cast malleable iron bodies and threaded male hubs with insulated throats. Fittings shall be UL listed for use with MC cable type specified:
a. Do not utilize MC cable for home runs. Home run wiring shall utilize EMT conduit from a junction box in accessible ceiling space to the panel.
b. Use of MC cable with integral 0-10V wire is acceptable.

2.3 OUTLET, PULL, AND JUNCTION BOXES

A. Four-inch (4”) square by 2-1/8-inch minimum sheet metal boxes for interior use.

B. Two-inch (2”) wide by three-inch (3”) long steel switch boxes, ganged together for multiple

switches.

C. Cast iron outlet or device boxes for outdoor locations.

D. Wiring Devices:
1. Receptacles: 20-amp, 125-volt, duplex, commercial grade, grounding type convenience outlets. Receptacles shall be color as selected by Architect. Provide 20-amp GFCI receptacles in bathrooms, kitchens, and exterior locations where required by code.
2. Switches: 20-amp, 125/277-volt, quiet type specification grade. Switches shall be color as selected by Architect.
3. Cover plates shall be plastic throughout with color as selected by Architect.

E. Cabinets and Enclosures: Construction shall be code gauge galvanized steel with standard concentric knockouts for conduit terminations. Cabinet shall be NEMA 250. Standard gray baked enamel finish. Continuous hinged steel door, lockable, and keyed to match panelboard locks.

2.4 GROUNDING

A. System Description:
1. Provide for the grounding and bonding of all electrical and communication apparatus, machinery, appliances, building components, fittings, and accessories where required to provide a permanent, continuous, low impedance, grounded electrical system.
2. Ground the electrical service system neutral at service entrance equipment.
3. The complete electrical installation including the neutral conductor, metallic conduits and raceways, boxes, cabinets, and equipment shall be completely and effectively grounded in accordance with all code requirements.
4. Provide ground riser for service to all telecommunication rooms.

B. Components:
1. Connections to structural steel, ground rods, or splices:
a. Exothermic welds shall be used for cable-to-cable and cable-to-ground rod and for cable to structural steel surfaces. Exothermic weld kits shall be as manufactured by Cadweld or equal. Each particular type of weld shall use a kit unique to that type of weld.
b. High-pressure compression type connectors shall be used for cable-to- cable and cable-to-ground rod connections. Connections shall be as manufactured by Thomas & Betts #53000 series or equal.
2. Ground conductor: Ground conductor shall be code size Type THW/THWN insulated copper wire, green in color.

C. Requirements:
1. An insulated ground conductor shall be installed in the following:
a. All feeders.
b. All branch circuit wiring runs.
2. Ground busses will be installed in the following areas:
a. All main electrical rooms.
b. All telecommunication closets.

D. Supporting Devices:
1. Expansion-shield type concrete anchors.
2. Pressed galvanized steel, concrete spot insert, with oval slot capable of accepting square or rectangular support nuts of 1/4-inch to 1/2-inch diameter thread for rod

support.
3. Steel threaded rod, sized for the load.
4. 1-1/2 inch by 1-1/2 inch 12-gauge galvanized steel construction channel with 17/32-inch diameter bolt holes, 1-1/2 inch on center in the base of the channel.
5. One (1) hole conduit straps of steel or malleable iron with malleable iron clamp-back spacer for surface mounted wall and ceiling applications. Steel channel conduit strap for support from construction channel. Steel conduit hanger for pendant support with threaded rod. Steel wire conduit support strap for support from independent #12-gauge hanger wires.

2.5 IDENTIFICATION

A. Nameplates.

B. Receptacle labels with panel and circuit designations using stick-on tape.

C. Panelboard directories (400 amp or less):
1. Six-inch by eight-inch (6" x 8") circuit directory card with frame and clear plastic covering shall be provided inside the inner panel door.
2. Circuit numbering.

D. Wire and terminal markers.

E. Conductor phase markers.

F. Underground conduit marker.

2.6 MANUFACTURERS: DISTRIBUTION SWITCHGEAR

A. Manufacturers:
1. Eaton Electrical/Cutler-Hammer.
2. Square D.
3. Siemens/I-T-E.
4. General Electric.

2.7 COMPONENTS

A. Switchboards and Distribution Boards:
1. Bolt-on molded case circuit breakers.
2. Copper bus bars.
3. NEMA 3R for exterior applications (main switchboard), NEMA 1 for interior applications.
4. Distribution boards shall be braced and rated to withstand 42 KAIC.

B. Disconnect Switches: Disconnect switches shall be NEMA heavy duty type switch with dead front construction, 240 or 600 VAC rated as applicable, with NEMA 1 enclosure for indoor use and NEMA 3R enclosure for outdoor use.

C. Panelboards:
1. Bolt-on molded case circuit breakers.
2. Copper bus and ground bus.
3. 10,000 AIC minimum rating for 120/208-volt panels.
4. 14,000 AIC minimum rating for 277/480-volt panels.
5. Door-in-door construction.

6. 100 percent neutral bus for 120/208-volt panels.
7. Provide minimum of ten (10) spare breakers or provisions for future breakers in all branch circuit panelboards. Provide at least four (4) spare 0.75-inch MTC into accessible ceiling space for all flush mount panelboards.

D. Circuit Breakers for Branch Circuit Panelboards:
1. Shall be molded case, bolt-on, trip indicating, thermal magnetic type ambient temperature compensated.
2. Breakers shall have toggle, quick make, and quick break operating mechanisms with trip-free feature to prevent contacts being held closed against overcurrent conditions in the circuit.

E. Transformers.

F. Fuses:
1. Fuses shall be supplied for the following services:
a. Motor and equipment fused disconnects.
b. Control and signal circuits.
2. All power fuses shall be current limiting type, Class RK-1 rejection type fuse, Buss Low-Peak LPN-RK (250 VAC), LPS-RK (600 VAC) or equal.

2.8 LIGHTING: LUMINAIRES

A. All fixtures shall have LED light source.

B. Standard lumen output shall meet or exceed the State of California Title 24 Energy Code for high efficiency luminaries.

C. Luminaires shall not draw power in the off state. Luminaires with integral occupancy, motion, photo-controls, or individually addressable luminaires with external control and intelligence are exempt from this requirement. The power draw for such luminaires shall not exceed 0.5 watts when in the off state.

D. Luminaire manufacturers shall adhere to device manufacturer guidelines, certification programs, and test procedures for thermal management.

E. Luminaires shall be fully accessible from below ceiling plane for changing drivers, power supplies, and arrays.

F. The finish of all fixtures and trim shall be submitted to and approved by the Architect prior to ordering.

G. All standard fixtures must bear UL label. Attaching of labels after delivery of fixtures is not acceptable.

H. All labels affixed to the fixture shall be in a location not visible from normal viewing angles.

I. Ferrous mounting hardware and accessories shall be finished using either a galvanic or phosphate primer/baked enamel process to prevent corrosion and discoloration of adjacent materials.

J. Fasteners shall be manufactured of galvanized steel.

K. Fixtures shall be free of light leaks and shall be designed to provide sufficient ventilation of

LED arrays.

L. All sheet metal work shall be free from tool marks and dents and shall have accurate angles bent as sharp as compatible with the gauges of the required metal. All intersections and joints shall be formed true and of adequate strength and structural rigidity to prevent any distortion after assembly. All surfaces shall be finished so as to eliminate all exposed sharp edges. All mitered corners or joints shall be accurately aligned with abutting intersecting members. Sheet metal work shall be properly fabricated so that planes will not deform (i.e. become concave or convex) due to normal expected ambient and operating conditions.

M. Wiring channels and LED array mountings shall be rigid and accurately constructed.

2.9 LED'S AND DRIVERS

A. Color temperature shall be 3,500K for interior lighting, 3,000K for exterior lighting.

B. Minimum CRI: 80.

C. Minimum life at 70 percent initial lamp lumens: 50,000 hours.

D. Drivers shall be integral to the fixture housing.

2.10 LIGHTING CONTROLS

A. Provide a complete network wireless lighting control system consisting of fixtures with integral controls, wireless dimmer switches, wireless ceiling mounted daylight sensor and occupancy sensors, and networking components.

B. The lighting control system shall provide sensor-based (occupancy, daylighting), and manual (on/off, dimming) lighting control. Exterior lighting will be controlled by time-based component of the system.

C. The system shall not require any centrally hardwired switching equipment.

D. The system shall be capable of wireless, wired, or hybrid wireless/wired architectures.

E. Space Control Requirements:
1. Unless otherwise noted on the plans, provide a minimum application of lighting controls as follows:
   a. Provide occupancy/vacancy sensors with manual or partial ON functionality in all spaces except toilet rooms, storerooms, library stacks, or other applications where hands-free operation is desirable and automatic ON occupancy sensors are more appropriate. Provide manual ON occupancy sensors for any enclosed office, conference room, meeting room, or classroom. For spaces with multiple occupants, or where line-of-sight may be obscured, provide ceiling or corner-mounted sensors and manual ON switches.
   b. Daylit areas:
      1) Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) where daylight contribution is available as defined by the 2016 Building Energy Efficiency Standards:
         a) All luminaires within each code-defined primary and secondary daylight zone or skylit zone shall be controlled separately from luminaires.
         b) Daytime setpoints for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in

compliance with relevant local building energy codes.

c) Multiple-leveled switched daylight harvesting controls may be utilized for areas marked on drawings.

d) Provide smooth and continuous daylight dimming for areas marked on Drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.

END OF DIVISION 13 34 23.03

SECTION 22 00 00 GENERAL PLUMBING PROVISIONS

PART 1 GENERAL

1.1 GENERAL CONDITIONS

A. The foregoing General and Special Conditions shall form a part of this Division with the same force and effect as though repeated herein. The provisions of this Section shall apply to all the Sections of Division 22.

1.2 CODES AND REGULATIONS

A. All work and materials shall be in full accordance with current rules and regulations of applicable codes and all California Amendments. Nothing in these drawings or specifications is to be construed to permit work not conforming to these codes. Should the drawings or specifications call for material or methods of construction of a higher quality or standard than required by these codes, the specifications shall govern. Applicable codes and regulations are:

1. California Code of Regulations – CCR:
   a. Title 8, Industrial Relations.
   b. Title 24, Building Standards.
2. California Building Code – CBC.
3. California Mechanical Code – CMC.
4. California Plumbing Code – CPC.
5. California Fire Code – CFC.
6. California Green Building Code.
7. American Gas Association – AGA.
8. American National Standards Institute – ANSI.
9. American Society of Heating, Refrigerating and Air Conditioning Engineers – ASHRAE.
10. American Society of Mechanical Engineers – ASME.
11. American Society for Testing and Materials – ASTM.
12. American Water Works Association – AWWA.
13. Cast Iron Soil Pipe Institute – CISPI.
14. California Electrical Code – CEC.
15. National Electrical Manufacturers Association – NEMA.
16. National Fire Protection Association – NFPA.
17. National Sanitation Foundation – NSF.
18. Plumbing and Drainage Institute – PDI.
19. Sheet Metal and Air Conditioning Contractors National Association – SMACNA.
20. Underwriters' Laboratory – UL.
21. Occupational Safety and Health Act - OSHA.
22. California Assembly Bill 1953 (AB1953).
23. ASCE 7-16, Chapter 13.

1.3 PERMITS AND FEES

A. The Contractor shall take out all permits and arrange for all tests in connection with his work as required by local ordinances. All charges are to be included in the work. Permits for equipment connected to a particular system are to be considered as a part of the work included under each system; for example, permits for electric motor connection are part of electrical work, permits for domestic water or gas connections are part of plumbing work. All charges for service connections, meters, etc. by utility companies or districts shall be included in the work.

1.4 COORDINATION OF WORK

A. Layout of materials, equipment and systems is generally diagrammatic unless specifically dimensioned. The actual locations of all materials, piping, fixtures, equipment, supports, etc. shall be carefully planned, prior to installation of any work, to avoid all interferences with each other, or with structural, electrical or architectural elements. Verify the proper voltage and phase of all equipment with the electrical plans. All conflicts shall be called to the attention of the Engineer prior to the installation of any work or the ordering of any equipment.

1.5 GUARANTEE

A. Guarantee shall be in accordance with the General Conditions. These specifications may extend the period of the guarantee for certain items. Where such extensions are called for, or where items are normally provided with guarantee periods in excess of that called for in the General Conditions, the Certificate of Guarantee shall be furnished to the Owner through the Engineer.

1.6 EXAMINATION OF SITE

A. The Contractor shall examine the site, compare it with plans and specifications, and shall have satisfied himself as to the conditions under which the work is to be performed. No allowance shall subsequently be made in his behalf for any extra expense to which he may be put due to failure or neglect on his part to make such an examination.

1.7 SUBMITTALS

A. Submit shop drawings in accordance with Division 01.

B. Shop Drawings: Within 30 days of contract award, the Contractor shall submit six copies of shop drawings for all materials, equipment, etc. proposed for use on this project. Material and equipment shall not be ordered or installed until written review is processed by the Engineer. Any item omitted from the submittal shall be provided as specified without substitution. All shop drawings must comply with the following:
   1. Shop drawings are required for all material and equipment items and shall include manufacturer's name and catalog numbers, dimensions, capacities, performance curves, and all other characteristics and accessories as listed in the specifications or on the drawings. Descriptive literature shall be current factory brochures and submittal sheets. Capacities shall be certified by the factory.
   2. All shop drawings shall be submitted at one time in a neat and orderly fashion in a suitable binder with title sheet including Project, Engineer and Contractor; Table of Contents; and indexed tabs dividing each group of materials or item of equipment. All items shall be marked with the specification paragraph number for which they are proposed. All equipment shall also be identified by the mark number as indicated on the drawings.
   3. All capacities, characteristics, and accessories called for in the specifications or on the drawings shall be highlighted, circled, or underlined on the shop drawings. Calculations and other detailed data indicating how the item was selected shall be included for items that are not scheduled. Data must be complete enough to permit detailed comparison of every significant characteristic which is specified, scheduled, or detailed.

C. Substitutions: Manufacturers and model numbers listed in the specifications or on the drawings represent the standard of quality and the features desired. Unless otherwise noted, alternate manufacturers may be submitted for review by the Engineer. Calculations

and other detailed data indicating how the item was selected shall be included. The Contractor shall assume full responsibility that substituted items or procedures will meet the specifications and job requirements and shall be responsible for the cost of redesign and modifications to the work caused by these items.

D. Review: Submittals will be reviewed for general conformance with the design concept, but this review does not guarantee quantity shown, nor does it supersede the responsibility of the Contractor to provide all materials, equipment, and installation in accordance with the drawings and specifications. The Contractor shall agree that shop drawing submittals processed by the Engineer are not Change Orders; that the purpose of shop drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept; that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use. The Contractor shall agree that if deviations, discrepancies or conflicts between shop drawings and design drawings and specifications are discovered either prior to or after shop drawing submittals are processed by the Engineer, the design drawings and specifications shall control and shall be followed.

1.8 OPERATION AND MAINTENANCE INSTRUCTIONS

A. Submit one electronic pdf copy for review and after approved submit three hard copies of the Operation and Maintenance Instructions and Wiring Diagrams for all equipment and parts lists for all equipment, etc. shall be submitted to the Engineer. All instructions shall be clearly identified by marking them with the same designation as the equipment item to which they apply (e.g. WH-1). All wiring diagrams shall agree with revised shop drawings and indicate the exact field installation. All instructions shall be submitted at the same time and shall be bound in a suitable binder with tabs dividing each type of equipment (e.g. Water Heaters, Pumps, Motors, etc.). Each binder shall be labeled indicating "Operating and Maintenance Instructions, Project Title, Contractor, Date" and shall have a Table of Contents listing all items included.

B. Verbal: The Contractor shall verbally instruct the Owner's maintenance staff in the operation and maintenance of all equipment and systems. The controls contractor shall present that portion of the instruction that applies to the control system. The Engineer's office shall be notified 96 hours prior to this meeting.

C. Acknowledgment: The Contractor shall prepare a letter indicating that all operation and maintenance instructions (printed, verbal and posted) have been given to the Owner, to the Owner's satisfaction. This letter shall be acknowledged (signed) by the Owner and submitted to the Engineer.

1.9 RECORD DRAWINGS

A. The Contractor shall maintain a set of prints for the project as a record of all construction changes made. As the Work progresses, the Contractor shall maintain a record of all deviations in the Work from that indicated on the drawings. Final location of all underground work shall be recorded by depth from finished grade and by offset distance from permanent surface structures, i.e. buildings, curbs and walks. In addition, the water, gas, sewer, etc. within the building shall be recorded by offset distances from building walls. The original drawings will be made available to the Contractor from which he shall have a set of reproducible drawings made. The Contractor shall then transfer the changes, notations, etc. from the marked-up prints to the reproducible drawings. The record drawings (marked-up prints and reproducibles) shall be submitted to the Engineer for review (as an alternative, the marked-up prints may be photocopied full size on reproducible stock).

PART 2 PRODUCTS

2.1 PROTECTIVE COATING FOR UNDERGROUND PIPING

A. All ferrous pipe below grade (except cast iron) shall have a factory applied protective coating of extruded high density polyethylene, 35 to 70 mils total thickness, X-Tru Coat, Scotchkote. All fittings and areas of damaged coating shall be covered with two layer double wrap of 10 mil polyvinyl tape to total thickness of 40 mils. Manville Corporation. Protective coating shall be extended 6" above surrounding grade.

2.2 CONCRETE ANCHORS

A. Concrete Anchors shall comply with CBC 1901A.3. Steel stud with expansion anchor requiring a drilled hole; powder driven anchors are not acceptable. Minimum concrete embedment shall be 4-1/2 diameters. Minimum spacing shall be 10 diameters center-to-center and 5 diameters from center to edge of concrete. Maximum allowable stresses for tension and shear shall be 80% of the test report values "with special inspection". Anchors shall be Hilti, Philips - or Approved equal.

2.3 SEISMIC RESTRAINTS

A. All plumbing systems (all equipment, piping, etc.) shall be provided with seismic restraints in accordance with "Seismic Restraint Systems Guidelines” OPM-0052-13 by Eaton/ Tolco.

2.4 SYSTEM IDENTIFICATION

A. Above Grade Piping: Provide markers on piping which is either exposed or concealed in accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid conveyed or its abbreviation, either by preprinted markers or stenciled marking, and include arrows to show the direction of flow. Comply with ANSI A13.1 for colors. Locate markers at ends of lines, near major branches and other interruptions including equipment in the line, where lines pass through floor, walls or ceilings or otherwise pass into inaccessible spaces, and at 50' maximum intervals along exposed portion of lines. Marking of short branches and repetitive branches for equipment connections is not required.

B. Equipment: All equipment shall be identified with a plastic laminated, engraved nameplate which bears the unit mark number as indicated on the drawings (e.g. WH-1). Provide 1/2" high lettering, white on black background. Nameplates shall be permanently secured to the unit.

C. Valves: Provide valve tags on all valves of each piping system, excluding check valves, valves within equipment, faucets, stops and shut-off valves at fixtures and other repetitive terminal units. Provide brass tags or plastic laminate tags. Prepare and submit a tagged valve schedule, listing each valve by tag number, location, and piping service. Mount in glazed frame where directed.

2.5 EQUIPMENT SUPPORT FRAMES

A. Unless specifically noted otherwise, it shall be the responsibility of Plumbing Contractor to furnish and install all support frames for its equipment.

PART 3 EXECUTION

3.1 SCHEDULING OF WORK

A. All work shall be scheduled subject to the approval of the Engineer and Owner. No work shall interfere with the operation of the existing facilities on or adjacent to the site.

3.2 CONDUCT OF WORK

A. The Contractor shall have at all times, as conditions permit, a sufficient force of workmen and quantity of materials to install the work contracted for as rapidly as possible consistent with good work and shall cause no delay to other Divisions engaged upon this project or to the Owner.

B. Plumbing Contractor shall arrange for all cutting necessary for the proper installation of its work, providing all sleeves and chases necessary. Cutting shall not be done in such a manner to impair the strength of the structure. Any damage resulting from work shall be repaired by the Contractor at his expense to the satisfaction of the Engineer.

C. Progressively, daily at the completion of each day's work, and at completion of the job, the Contractor shall thoroughly clean all of his work, removing all debris, stain and marks resulting from his work.

D. **IAQ Management plan will be in effect for Cal Green requirements. Adhesives and mastic must comply with low VOC requirements and documentation (MSDS, etc.) shall be provided with submittals.**

3.3 EXCAVATION AND BACKFILL

A. Excavation: Trenches are to be excavated to grade and depth established by drawings. Unless otherwise noted, minimum earth cover above top of pipe shall be 24", not including base and paving in paved areas. Width of trenches at top of pipe shall be a minimum of 16" plus the outside diameter of the pipe. Provide all shoring required by site conditions. Barrel of pipe shall have uniform support on trench bottom, hand excavate additional depth at bells, hubs, and fittings. Where over-excavation occurs, provide compacted selected backfill to pipe bottom. Where ground water is encountered, remove to keep excavation dry, using well points and pumps as required.

B. Backfill:
1. Around Pipe and to One Foot Above Pipe: Material shall be river run sand or native granular free flowing material, free of clay lumps, silt or vegetable matter and shall have 100% passing through the No. 4 sieve and a maximum of 3% passing through the No. 200 sieve. Place carefully around and on top of pipe, taking care not to disturb piping. Consolidate with vibrator.
2. One Foot Above Pipe to Grade: Material to be sandy or silty loam, free of lumps, laid in 6" layers, uniformly mixed, to proper moisture and compacted to required density. If backfill is determined to be suitable and required compaction is demonstrated by laboratory test, water compaction in 6" layers may be used, subject to approval by the Engineer.
3. Remove all water sensitive settlement from trench backfill regardless of location and compaction requirements.

C. Compaction: Compact to a density of 95% within building and 90% outside building. Demonstrate proper compaction by testing at one-half of the trench depth. Perform three tests per 100' of trench.

3.4 OPENINGS, CUTTING AND PATCHING

A. The locations and dimensions for openings through walls, floors, ceilings, foundations,

footings, etc. required to accomplish the work under this Specification Division shall be provided under this Division. The actual openings and the required cutting and patching shall be provided. Coring through existing concrete or masonry walls, floors, ceilings, foundations, footings, etc., and saw cutting of concrete floors or asphaltic concrete required to accomplish the work under this Specification Division shall be provided under this Division. Patching of these surfaces shall also be provided. Cutting and coring shall not impair the strength of the structure. Any damage resulting from this work shall be repaired at the Contractor's expense to the satisfaction of the Engineer.

3.5 MANUFACTURER'S RECOMMENDATIONS

A. All material, equipment, devices, etc., shall be installed in accordance with the recommendations of the manufacturer of a particular item. The Contractor shall be responsible for all installations contrary to the manufacturer's recommendations. The Contractor shall make all necessary changes and revisions to achieve such compliance. Manufacturer's installation instructions shall be delivered to and maintained at the job site through the construction of the project.

3.6 QUIETNESS

A. Piping and equipment shall be arranged and supported so that vibration is a minimum and is not carried to the building structure or spaces.

3.7 DAMAGES BY LEAKS

A. The Contractor shall be responsible for damages to other work caused by leaks in the temporary or permanent piping systems prior to completion of work and during the period of the guarantee, and for damages to other work caused by disconnected pipes or fittings, and the overflow of equipment prior to completion of the work.

3.8 CLEANING

A. Progressively and at completion of the job, the Contractor shall thoroughly clean all of his work, removing all debris, stain and marks resulting from his work.

END OF SECTION 22 00 00

SECTION 22 00 01 PLUMBING

PART 1 GENERAL

1.1 GENERAL CONDITIONS

A. The foregoing Section 22 00 00, General Plumbing Provisions shall form a part of this specification.

1.2 SCOPE

A. Included: Perform all work necessary and required to complete construction as indicated. Such work includes the furnishings of all labor, materials, and services necessary for a complete, lawful, and operating plumbing system with all equipment as shown or noted on the drawings or as specified herein. The work includes, but is not necessarily limited to, the following:
   1. Sanitary sewer system.
   2. Domestic water system.
   3. Plumbing fixtures.
   4. Plumbing equipment.

B. Work Specified Elsewhere:
   1. Line voltage power wiring (60 volts or greater), motor starters in motor control centers, and disconnect switches are included in the Electrical Division, unless otherwise noted.
   2. Access doors.
   3. Concrete and reinforcing steel.
   4. 23 00 01, Heating, Ventilating and Air Conditioning.

1.3 CODES AND STANDARDS

A. All pipe, pipe or plumbing fittings or fixture, solder, or flux shall be lead free that provides water for human consumption per California Assembly Bill 1953 (AB1953).

B. See Section 22 00 00 for additional requirements.

1.4 SUBMITTALS

A. Provide product data for all materials per Division 01.

PART 2 MATERIALS

2.1 PIPING MATERIALS

A. Sanitary Sewer:
   1. Soil, Waste and Vent Piping:
      a. Inside Building and Within Five Feet of Building Walls: Standard weight coated cast iron pipe and fittings. Plain end with neoprene gasket and stainless steel retaining sleeve, CISPI 301, ASTM A888 hubless cast-iron, or hub end with rubber gasket, ASTM A74, ASTM C564. Size 2” and smaller above grade may be standard weight galvanized steel, ASTM A53, with coated cast iron recessed drainage fittings, ANSI B16.12. All cast iron pipe and couplings shall be American made and tested, no imported pipe or coupling is acceptable. Use heavy-duty (4-Band) couplings for all soil and waste piping. Use standard (2-Band) couplings for all

vent piping. Tyler Pipe, AB & I Foundry or Charlotte Pipe. Couplings shall be Tyler, Anaco or Husky.

b. Outside Building:
   1) Where cover is less than 15", pipe shall be cast iron, same as for inside of building.

2. Cleanouts: Floor cleanouts: Smith 4020 with nickel bronze top in finished areas; Smith 4220 in utility areas. Wall cleanouts: Smith 4530 with stainless steel cover and screw. Comparable models of Josam, Wade, Zurn or equal.
3. Cleanout Box: Precast reinforced concrete. Cast iron lid marked for service. Christy or equal; F22 in foot traffic area; G5 in roadways.

B. Water:
1. Hot and Cold Water Piping:
   a. Inside Building: Type L hard temper seamless copper, ASTM B88. Wrought copper fittings ANSI B16.22. 95/5 tin-silver soldered joints. Brazesafe, Silcan or equal brazing material.
   b. Outside Building Below Grade: Same as Inside Building with protective coating on ferrous pipe or Schedule 40 PVC pipe thru 2", Class 315 2" thru 4".

C. Valves and Specialties:
1. Valves:
   a. General: Manufacturer's model numbers are listed to complete description. Milwaukee, Kitz, Apollo, Nibco, Stockham or equal. All valves shall be full size of upstream piping. **Ball valves shall be substituted for gate valves 2" and smaller. Butterfly valves shall be substituted for gate valves 2-1/2" and larger. C_V factors for ball valves shall not be less than equal size gate valves.**
   b. Gate Valve: 2" and smaller: All bronze, rising stem, union bonnet, wedge disk, 200 psi WOG. Milwaukee No. 1152. The material of the valve stem shall be limited to a maximum of six (6) percent zinc content. 2-1/2" and larger: Iron body, bronze mounted. Non-rising stem. Wedge disk. 200 psi WOG. Flanged or AWWA hub as applicable. Open/ closed indicator. Milwaukee No. F2882. Underground valves shall have square operating nut.
   c. Check Valve: 2" and smaller: All bronze swing check, regrinding. 200 psi WOG. Milwaukee No. 509, 1509 or equal. 2-1/2" and larger: Non-slam type, 125 psi iron body wafer type with renewable seats and stainless steel spring. Milwaukee 1400 series or equal.
   d. Ball Valves: Two or three piece construction, forged bronze body, chrome plated brass ball, threaded ends, teflon seats, PTFE or reinforced teflon stem seals, lever handle. Underground valves shall have "T" handle. Provide one operating "T" extension handle for all underground valves. Milwaukee BA100/150, BA300/350, Nibco or equal.
   e. Valve Box: Precast reinforced concrete. Cast iron lid marked for service. Christy or equal; F22 in foot traffic areas: G5 in roadways.
   f. Butterfly Valve: Iron Body, Aluminum bronze disk (connection to shaft shall not be by pins, screws, or bolts). Ductile body PPS coated with EPPM coated ductile disc. O-ring seals. Resilient removable seat. 416 stainless steel two piece shaft. 6" and smaller valves shall have multi-position lever handle. Underground valves shall have square operating nut. Provide one operating "T" handle for underground valves. Provide 2" extension neck at insulated pipes. Milwaukee "C" series, Kitz or equal.
2. Miscellaneous Specialties:
   a. Temperature and Pressure Relief Valve: ASME rated fully automatic, reseating combination temperature and pressure relief valve sized in accordance with energy input. Sensing element immersed within upper 6" of tank. Watts.
   b. Union: 2" and Smaller: AAR malleable iron, bronze to iron ground seat. 300 psi.
   c. Dielectric Coupling: Insulating coupling rated for 250 psig. EPCO or equal.

d. Shock Absorbers: Sioux Chief “Hydra-Rester”, Zurn “Shoktrol”, PPP “SC Series” or equal.

D. Miscellaneous Piping Items:
1. Pipe Support:
a. Pipe Hanger: Adjustable split ring, swivel hanger and rod. Black malleable iron. Size and maximum load per manufacturer's recommendation. Felt lined, B-Line B3690F, Unistrut or equal.
b. Construction Channel: 12 gage 1-5/8" x 1-5/8" steel channel. Single or multiple section. Self-locking nuts and fittings. B-Line, Unistrut, Superstrut or equal.
2. Pipe Sleeves: 24 gage galvanized steel. Adjus-to-Crete #10 with #99 thimble for floors. #100 for walls.
3. Flashing: Vent flashing and flashing for piping through roof shall be prefabricated 24 gauge galvanized steel roof jacks with 8" square flange around pipe sealed with weatherproofing mastic.

2.2 PIPING INSULATION MATERIALS

A. General: All piping insulation materials shall have fire and smoke hazard ratings as tested under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50.

B. Pipe Insulation: Elastomeric type, ASTM C534, with a thermal conductivity of 0.27 at 75°F when measured in accordance with ASTM C177 or ASTM C518.
1. Wall thickness: 3/4 in.
2. Adhesive: Conform to Manufacturer's recommendations.

C. Pre-molded Fiberglass: Heavy density sectional pre-molded fiberglass with vapor barrier laminated all-service jacket and pressure sealing vapor barrier lap. Thermal conductivity shall not exceed 0.25 Btu-in/hr-sq. ft-degrees F, at a mean temperature of 50 degrees F. Perm rating 0.02, ASTM E96. Puncture rating 50 Beach units, ASTM D781. Provide 3" (min.) wide tape of same material as lap for butt joints. For hot water piping, thickness shall be 1" for pipe sizes less than 2", 1-1/2" thickness for pipe sizes 2" and larger. CSG Insulation Corp., Manville, Owens-Corning or equal.

D. Fiberglass Blanket: Unfaced. Thermal conductivity shall not exceed 0.25 Btu-in/hr sq. ft-degrees F, at a mean temperature of 50 degrees F. 1-1/2" thickness. Manville, Owens-Corning or equal.

E. PVC Jacket (for exposed pipes and fittings): Pre-molded polyvinyl chloride (PVC) jackets. Size to match application. Provide PVC vapor barrier, pressure-sealing tape by same manufacturer. Zeston or equal.

2.3 FIXTURES

A. General: This Division shall rough-in for and install all plumbing fixtures shown on drawings. All trim not concealed shall be brass with polished chromium plate finish unless otherwise noted. All enameled fixtures shall be acid resisting. Standard color is white unless otherwise noted.

B. Schedule: Refer to Plumbing Fixture Schedule on the drawings for list of fixtures. Manufacturer's model numbers are listed to complete description. Water consumption quantities listed on schedule are maximum. Equivalent models of American Standard, Crane, Haws, Kohler, Eljer, Zurn or equal. For drainage fixtures, equivalent models of Josam, Smith, Wade, Zurn or equal.

C. Stops and P-traps: All fixtures shall be provided with stops and p-traps as applicable.
   1. Stops: All hot and cold water supplies shall be 1/2" angle stops with IPS inlets and compression outlets, stuffing box, screwdriver lock shield, and 1/2" flexible brass tubing riser. Speedway. Wall mounted trim shall have concealed loose key wall stop. Chicago 1771 or equal.
   2. P-traps: Brass, ground joint. 17 gage. American Standard, California Tubuler or equal.
      a. Trap primers shall be provided with ball valve and cylinder key-lock access panel for all floor drains and floor sinks. PPP, Inc. or equal.

2.4 EQUIPMENT

A. General Requirements:
   1. General: These equipment specifications are to supplement the drawings. Refer to schedules on drawings for the specific equipment to be provided. Capacities shall be in accordance with the schedules shown on the drawings. Capacities are to be considered minimum.
   2. Dimensions: Equipment must conform to space requirements and limitations as indicated on the drawings and as required for operation and maintenance. Equipment will not be accepted that does not readily conform to space conditions.
   3. Ratings: Electrical equipment shall be in accordance with NEMA Standards and UL listed where applicable standards have been established.
   4. Basis of Design: Manufacturers and model numbers listed in schedules as the basis of design are intended to represent the standard of quality and the features desired.
   5. Piping: Each item or assembly of items shall be furnished completely piped for connection to services. Control valves and devices shall be provided. Equipment requiring domestic water for non-potable use shall be provided with backflow preventer acceptable for intended use by local governing authorities.
   6. Electrical:
      a. General: Each item or assembly of items shall be furnished completely wired to individual terminal blocks for connection to single branch electrical circuit. All electrical accessories and controls required by equipment shall be furnished. Provide terminal blocks for controls not included in equipment package. Manual and magnetic starters shall have ambient compensating running over-current protection in all ungrounded conductors. Magnetic starters shall be manual reset. Controllers and other devices shall be in NEMA 3 or 12 enclosures as applicable.
      b. Wiring: Conductors, conduit, and wiring shall be in accordance with Electrical Specifications. Individual items within assembly shall be separately protected with dead front, fused disconnect, fuse block, or circuit breaker for each ungrounded conductor, all accessible on operating side of equipment. Switches, contacts, and other devices shall be in ungrounded conductors.
      c. Motors: Shall be rated, constructed, and applied in accordance with NEMA and ANSI Standards without using service factor. Single-phase motor shall be of type to suit application. Three-phase motors shall be open drip-proof, NEMA B design on pumps and fans, NEMA C on reciprocating equipment, sealed ball bearing, three-phase induction. Design shall limit starting inrush current and running current to values shown on drawings.
      d. Starters: Motor starters shall be provided for all equipment except where starter is in a motor control center as designated on the electrical drawings.
      e. Control Voltage: Equipment connected to greater than 240 volts shall be provided with 120 volt transformer if separate source is not indicated on plans. 240 volt control is acceptable if confined within control panel.
      f. Submittals: Included in shop drawings shall be internal wiring diagrams and manufacturer's recommended external wiring.

B. Water Heater, Instantaneous Electric: Tankless, automatic temperature control. High limit

control. Provide microprocessor controls. UL listed and CEC approved. Warranty for a period of 1-year minimum. Rheem, Chronomite, Eemax or approved equal.

PART 3 EXECUTION

3.1 PIPING INSTALLATION

A. General:
1. Piping Layout: Piping shall be concealed in walls, above ceilings, or below grade unless otherwise noted. Exposed piping shall run parallel to room surfaces; location to be approved by Owner's Representative. No structural member shall be cut, notched, bored, or otherwise altered unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed. All piping shall be installed in a manner to ensure unrestricted flow, eliminate air pockets, prevent any unusual noise, and permit complete drainage of the system. All piping shall be installed to permit expansion and contraction without strain on piping or equipment. Expansion joints shall be installed as required. Vertical lines shall be installed to allow for building settlement without damage to piping. All exposed piping to be primed and painted, see painting section.
2. Joints:
   a. Threaded: Pipe shall be cut square and reamed to full size. Threads shall be in accordance with ANSI B2.1. Joint compound or tape suitable for conveyed fluid shall be applied to male thread only. Joints shall be made with three threads exposed.
   b. Welded or Brazed: Filler rod shall be of the same suitable alloy as pipe. Welding or brazing shall be performed in accordance with requirements of recognized published standards of practice and by licensed or otherwise certified contractors. Welder or Brazer shall be a person who specialized in welding or brazing of pipes and holds a recognized certificate of competency from a recognized testing laboratory, based on the requirements of the ASME Boiler and Pressure Vessels Code, Section 9.
   c. Other: Joints other than threaded or welded shall be installed in accordance with manufacturer's recommendations.
   d. Open Ends: Open ends of piping shall be capped during progress of work to preclude foreign matter.
   e. Electrical Equipment: Joints shall be avoided, where possible, over electrical equipment.
   f. Copper pipe 1-1/2" or less may be soldered. Above 1-1/2" and all below grade shall be brazed.
3. Fittings:
   a. Standard Fittings: All joints and changes in direction shall be made with standard fittings. Close nipples shall not be used.
   b. Reducers: Pipe size reduction shall be made with bell reducer fittings. Bushings shall not be used.
   c. Unions: A union shall be installed on the leaving side of each valve, at equipment connections, and elsewhere as necessary for assembly or disassembly of piping.
   d. Valves: All valves shall be full line size. At equipment connections, valves shall be full size of upstream piping.
4. Pipe Support:
   a. General: Hangers shall be placed to support piping without strain on joints or fittings. Maximum spacing between supports shall be as specified below. Actual spacing requirements will depend on structural system. Refer to drawings for additional requirements and attachment to structure. Vertical piping shall be supported at floor and ceiling. Support pipe within 12" of all changes in direction. Support individual pipes with pipe hanger. All pressure piping, drainage piping

above grade and metallic piping of dissimilar metal from hangers shall have isolating shield, or felted hangers.

1) Screwed Pipe:

Pipe Size Between Supports*	Max. Spacing
(in)	(ft)
½	6
¾	8
1	8
1-1/4 & larger	10

* Based on straight lengths of pipe with couplings only. Provide additional supports for equipment, valves, or other fittings.

2) Copper Tubing: Copper tubing shall be supported at approximately six (6) foot intervals for piping one and one-half (1-1/2) inches and smaller in diameter and ten (10) foot intervals for piping two (2) inches and larger in diameter.

3) Gravity Drainpipe: Piping shall be supported at each length of pipe or fitting, but in no case at greater spacing than indicated above for pressure pipe.

b. Trapeze: Trapeze hangers of construction channel and pipe clamps may be used. Submit design to Engineer for approval.

5. Excavation and Backfill: Minimum cover on all piping shall be as follows unless otherwise noted:
   a. Up to 2-1/2" pipe - 24" cover.
   b. 3" and larger pipe - 30".
6. Miscellaneous:
   a. Escutcheons: Provide chromium plated escutcheons where piping penetrates walls, ceilings, or floors in finished areas.
   b. Pipe Sleeves: All piping passing through concrete shall be provided with pipe sleeves. Allow 1" clearance between sleeve and pipe or pipe insulation.
   c. Dielectric Couplings: Dielectric couplings shall be installed wherever piping of dissimilar metals are joined.
   d. Shock Absorbers: Install per manufacturers recommendations.

B. Sanitary Sewer Piping:
1. General: Where inverts are not indicated, sanitary sewer piping shall be installed at 1/4" per foot pitch. Piping 4" and larger may be installed at 1/8" per foot pitch where structural or other limitations prevent installation at a greater pitch.
2. Cleanouts: Install cleanouts at ends of lines, at changes of direction greater than 45 degrees, and at not greater than 100 foot intervals. Locate interior cleanouts in accessible locations and bring flush to finished surface. Cleanouts at urinals shall be installed above urinal.
3. Vents: Vents shall terminate not less than 6" above the roof nor less than 12" from any vertical surface nor within 10 feet of any outside air intake. Install horizontal vent lines at 1/4" per foot pitch. Offset vents 2 feet minimum from gutters, parapets, ridges, and roof flashing.
4. Acid Waste & Vent: Push together joints tightly, then mark with permanent marker before fusing joints. After fusing joints with piping manufacturer's tools then cut off fusing tabs on pipe. Tailpiece and traps shall be threaded union fittings only.

C. Water Piping: Connections to branches shall be made from the top side of the main. Supply header in fixture battery shall be full size to last fixture, reducing in size only on individual connections to each fixture in battery. Provide ball valve shutoff for each building and at each connection to equipment and trap primers. Shock absorbers shall be installed in a vertical position at end of branch runs as specified in this section whether specifically shown or not on drawings. Connections to equipment shall be made with flexible connectors. Non-

metallic pipe shall have 18 AWG copper tracer wire laid on top of pipe and taped in place at 15-foot spacing, terminate 4" above grade at ends of pipe runs.

3.2 PIPING INSULATION INSTALLATION

A. Domestic Tempered Water Supply:
   1. General: All domestic tempered water supply piping, except for exposed connections to fixtures, shall be insulated. Do not insulate unions or valves less than 2", unless exposed to weather.
   2. Install elastomeric pipe insulation by slipping over end of pipe. Where not feasible, slit insulation longitudinally, snap over piping and seal with adhesive. Insulate fittings with larger diameter sleeves or insulation, lapping pipe insulation a minimum of 2 in.
   3. Butt sections of insulation tightly together and seal with adhesive to provide a continuous vapor and thermal barrier.
   4. Pipe: Apply pre-molded fiberglass sections to pipe using integral pressure sealing lap adhesive in accordance with manufacturer's recommendations. Stagger longitudinal joints. Seal butt joints with factory supplied sealing tape.
   5. Fittings and Valves:
      a. Wrap fitting with pre-cut fiberglass blanket to thickness matching adjoining insulation. Cover blanket with PVC jacket in accordance with manufacturer's recommendations. Seal all joints with factory supplied pressure sealing vapor barrier tape with 2" (min.) overlap on both sides of joint. Insulate valves to stem.
      b. For miscellaneous fittings for which PVC jackets are not available or where proximity of fittings precludes a neat-appearing installation, the contractor may cover the fiberglass blanket with stretchable glass fabric and at least two coats of vapor barrier coating. All exposed ends of insulation shall be adequately sealed.

B. ADA Compliant Fixtures:
   1. At lavatories which are to be ADA Compliant the P-Trap and angle stop assemblies & water heater shall be covered with Truebro Lav-Shield, or equivalent. Abrasion resistant exterior cover shall be smooth. Fasteners shall be tamper resistant.

3.3 FIXTURE INSTALLATION

A. Fixture Height: Shall be standard height except those specified as ADA Compliant. Such fixtures shall be mounted in accordance with CBC, Section 11B, Division 6 and drawing details.

B. Wall Hung Fixtures: Shall be provided with proper backing and hanger plates secured to wall. Fixtures mounted on carriers shall bear against stop nuts, clear of wall surface. Caulk fixtures against walls with white G.E. “Sanitary SCS1700” silicone sealant. Caulking shall be smooth and flush with fixture surface (not concave).

C. Floor Drains or Floor Sinks: Shall be placed parallel to room surfaces, set level, flush with floor, and adjusted at proper height to drain and easily accessible for inspection and cleaning. Cover openings during construction to keep all foreign matter out of drain line.

D. Other Connections: Rough-in and connection for trim or fixtures supplied by others shall be included in this specification section.

E. Floor Mounted Fixtures: Shall be provided with proper support plates. Caulk fixtures against floors with white G.E. “Sanitary SCS1700” silicone sealant. Caulking shall be smooth and flush with fixture surface (not concave).

3.4 EQUIPMENT INSTALLATION

A. General: It shall be the responsibility of the equipment installer to ensure that no work done under other specification sections shall in any way block, or otherwise hinder the equipment.

B. Connections to Equipment: Where size reductions are required for connections to equipment, they shall be made immediately adjacent to the equipment and, if possible, inside the equipment cabinet.

3.5 TESTS AND ADJUSTMENTS

A. General: Unless otherwise directed, tests shall be witnessed by the Owner's Representative. Work to be concealed shall not be enclosed until prescribed tests are made. Should any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test, and repair his work, and that of other contractors, to original conditions. Leaks and defects shown by tests shall be repaired and entire work retested. Tests may be made in sections. However, all connections between sections previously tested and new section shall be included in the new test. New sections shall be isolated from existing sections for testing purposes. There shall be no drop in pressure during test except that due to ambient temperature changes. All components of system not rated for test pressure shall be isolated from system before test is made. Test the new sections or branches of piping only.

B. Gravity System:
1. Sanitary Sewer: All ends of the new sections of sewer system shall be capped and lines filled with water to the top of the highest vent, 10 feet above grade minimum. This test shall be made before any fixtures are installed. Test shall be maintained until all joints have been inspected, but no less than 2 hours.
2. Condensate Piping: Maintain 15 psig water pressure for a duration of 4 hours.

C. Pressure Systems:
1. General: There shall be no drop in pressure during test except that due to ambient temperature changes. All components of system not rated for test pressure shall be isolated from system before test is made. Test the new sections or branches of piping only.
2. Domestic Tempered and Cold Water Piping: Maintain 60 psig water pressure for a minimum duration of 2 hours.

D. Accessible Lavatories:
1. Faucet controls and operating mechanisms shall be installed and tested to comply per CBC Section 11B-606.4.

3.6 DISINFECTION

A. Disinfect all domestic hot and cold water piping systems in accordance with California Plumbing Code Sections 609.9.1 through 609.9.4. The method to be followed shall be that prescribed by the Health Authority or, in case no method is prescribed by it, the following:
1. The pipe system shall be flushed with clean, potable water until potable water appears at the points of outlet.
2. The system or parts thereof shall be filled with a water-chlorine solution containing not less than 50 parts per million of chlorine, and the system or part thereof shall be valved-off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water-chlorine solution containing not less than 200 parts per million of chlorine and allowed to stand for 3 hours.
3. Following the allowed standing time, the system shall be flushed with clean, potable water until the chlorine residual in the water coming from the system does not exceed the chlorine residual in the flushing water.
4. The procedure shall be repeated where it is shown by bacteriological examination

made by an approved agency that contamination persists in the system.

B. Disinfection process shall be performed by certified testing agency or in cooperation with health department having jurisdiction and witnessed by a representative of the Architect. During procedure, signs shall be posted at each water outlet stating, "ChIorination - Do Not Drink". After disinfection, water samples shall be collected by certified testing agency or by health department for bacteriological analysis. Certificate of Bacteriological Purity shall be obtained and delivered to the Owner through the Owner's Representative.

END OF SECTION 22 00 01

SECTION 23 00 00 GENERAL MECHANICAL PROVISIONS

PART 1 GENERAL

1.1 GENERAL CONDITIONS

A. The foregoing General and Special Conditions shall form a part of this Division with the same force and effect as though repeated herein. The provisions of this Section shall apply to all the Sections of Division 23.

1.2 CODES AND REGULATIONS

A. All work and materials shall be in full accordance with current rules and regulations of applicable codes and all California Amendments. Nothing in these drawings or specifications is to be construed to permit work not conforming to these codes. Should the drawings or specifications call for material or methods of construction of a higher quality or standard than required by these codes, the specifications shall govern. Applicable codes and regulations are:

1. California Code of Regulations – CCR:
   a. Title 8, Industrial Relations.
   b. Title 24, Building Standards.
2. California Building Code – CBC.
3. California Mechanical Code – CMC.
4. California Plumbing Code – CPC.
5. California Fire Code – CFC.
6. California Green Building Code.
7. Air Diffusion Council – ADC.
8. American Gas Association – AGA.
9. Air Moving and Conditioning Association – AMCA.
10. American National Standards Institute – ANSI.
11. Air Conditioning and Refrigeration Institute – ARI.
12. American Society of Heating, Refrigerating and Air Conditioning Engineers – ASHRAE.
13. American Society of Mechanical Engineers – ASME.
14. American Society for Testing and Materials – ASTM.
15. American Water Works Association – AWWA.
16. California Electrical Code – CEC.
17. National Electrical Manufacturers Association – NEMA.
18. National Fire Protection Association – NFPA.
19. Sheet Metal and Air Conditioning Contractors National Association – SMACNA.
20. Underwriters' Laboratory – UL.
21. Occupational Safety and Health Act - OSHA.
22. ASCE 7-16, Chapter 13.

1.3 PERMITS AND FEES

A. The Contractor shall take out all permits and arrange for all tests in connection with his work as required by local ordinances. All charges are to be included in the work. Permits for equipment connected to a particular system are to be considered as a part of the work included under each system; for example, permits for electric motor connection are part of electrical work, permits for domestic water or gas connections are part of plumbing work. All charges for service connections, meters, etc. by utility companies or districts shall be included in the work.

1.4 COORDINATION OF WORK

A. Layout of materials, equipment and systems is generally diagrammatic unless specifically dimensioned. The actual locations of all materials, piping, ductwork, equipment, supports, etc. shall be carefully planned, prior to installation of any work, to avoid all interferences with each other, or with structural, electrical, or architectural elements. Verify the proper voltage and phase of all equipment with the electrical plans. All conflicts shall be called to the attention of the Engineer prior to the installation of any work or the ordering of any equipment.

1.5 GUARANTEE

A. Guarantee shall be in accordance with the General Conditions. These specifications may extend the period of the guarantee for certain items. Where such extensions are called for, or where items are normally provided with guarantee periods in excess of that called for in the General Conditions, the Certificate of Guarantee shall be furnished to the Owner through the Engineer.

1.6 EXAMINATION OF SITE

A. The Contractor shall examine the site, compare it with plans and specifications, and shall have satisfied himself as to the conditions under which the work is to be performed. No allowance shall subsequently be made in his behalf for any extra expense to which he may be put due to failure or neglect on his part to make such an examination.

1.7 SUBMITTALS

A. Submit shop drawings in accordance with Division 01.

B. Shop Drawings: Within 30 days of contract award, the Contractor shall submit six copies of shop drawings for all materials, equipment, etc. proposed for use on this project. Material and equipment shall not be ordered or installed until written review is processed by the Engineer. Any item omitted from the submittal shall be provided as specified without substitution. All shop drawings must comply with the following:
   1. Shop drawings are required for all material and equipment items and shall include manufacturer's name and catalog numbers, dimensions, capacities, performance curves, and all other characteristics and accessories as listed in the specifications or on the drawings. Descriptive literature shall be current factory brochures and submittal sheets. Capacities shall be certified by the factory.
   2. All shop drawings shall be submitted at one time in a neat and orderly fashion in a suitable binder with title sheet including Project, Engineer, and Contractor; Table of Contents; and indexed tabs dividing each group of materials or item of equipment. All items shall be marked with the specification paragraph number for which they are proposed. All equipment shall also be identified by the mark number as indicated on the drawings.
   3. All capacities, characteristics, and accessories called for in the specifications or on the drawings shall be highlighted, circled, or underlined on the shop drawings. Calculations and other detailed data indicating how the item was selected shall be included for items that are not scheduled. Data must be complete enough to permit detailed comparison of every significant characteristic which is specified, scheduled, or detailed.

C. Substitutions: Manufacturers and model numbers listed in the specifications or on the drawings represent the standard of quality and the features desired. Unless otherwise noted, alternate manufacturers may be submitted for review by the Engineer. Calculations and other detailed data indicating how the item was selected shall be included. The Contractor shall assume full responsibility that substituted items or procedures will meet the specifications and job requirements and shall be responsible for the cost of redesign and

modifications to the work caused by these items.

D. Review: Submittals will be reviewed for general conformance with the design concept, but this review does not guarantee quantity shown, nor does it supersede the responsibility of the Contractor to provide all materials, equipment, and installation in accordance with the drawings and specifications. The Contractor shall agree that shop drawing submittals processed by the Engineer are not Change Orders; that the purpose of shop drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept; that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use. The Contractor shall agree that if deviations, discrepancies or conflicts between shop drawings and design drawings and specifications are discovered either prior to or after shop drawing submittals are processed by the Engineer, the design drawings and specifications shall control and shall be followed.

1.8 OPERATION AND MAINTENANCE INSTRUCTIONS

A. Submit one electronic pdf copy for review and after approved submit three hard copies of the Operation and Maintenance Instructions and Wiring Diagrams for all equipment and parts lists for all equipment, etc. shall be submitted to the Engineer. All instructions shall be clearly identified by marking them with the same designation as the equipment item to which they apply (e.g. AC-1). All wiring diagrams shall agree with revised shop drawings and indicate the exact field installation. All instructions shall be submitted at the same time and shall be bound in a suitable binder with tabs dividing each type of equipment (e.g. Fans, Motors, etc.). Each binder shall be labeled indicating "Operating and Maintenance Instructions, Project Title, Contractor, Date" and shall have a Table of Contents listing all items included.

B. Verbal: The Contractor shall verbally instruct the Owner's maintenance staff in the operation and maintenance of all equipment and systems. The controls contractor shall present that portion of the instruction that applies to the control system. The Engineer's office shall be notified 96 hours prior to this meeting.

C. Posted: The Contractor shall prepare operation instructions for all systems which shall be typewritten, reviewed by the Engineer, and mounted under glass adjacent to the appropriate temperature control panel. These instructions shall include applicable temperature control diagrams.

D. Acknowledgment: The Contractor shall prepare a letter indicating that all operation and maintenance instructions (printed, verbal and posted) have been given to the Owner, to the Owner's satisfaction. This letter shall be acknowledged (signed) by the Owner and submitted to the Engineer.

1.9 RECORD DRAWINGS

A. The Contractor shall maintain a set of prints for the project as a record of all construction changes made. As the Work progresses, the Contractor shall maintain a record of all deviations in the Work from that indicated on the drawings. Final location of all underground work shall be recorded by depth from finished grade and by offset distance from permanent surface structures, i.e. buildings, curbs and walks. In addition, the water, gas, under-floor ducts, etc. within the building shall be recorded by offset distances from building walls. The original drawings will be made available to the Contractor from which he shall have a set of reproducible drawings made. The Contractor shall then transfer the changes, notations, etc. from the marked-up prints to the reproducible drawings. The record drawings (marked-up prints and reproducibles) shall be submitted to the Engineer for review (as an alternative, the marked-up prints may be photocopied full size on reproducible stock).

PART 2 PRODUCTS

2.1 PROTECTIVE COATING FOR UNDERGROUND PIPING

A. All ferrous pipe below grade (except cast iron) shall have a factory applied protective coating of extruded high density polyethylene, 35 to 70 mils total thickness, X-Tru Coat, Scotchkote. All fittings and areas of damaged coating shall be covered with two layer double wrap of 10 mil polyvinyl tape to total thickness of 40 mils. Manville Corporation. Protective coating shall be extended 6" above surrounding grade.

2.2 CONCRETE ANCHORS

A. Concrete Anchors shall comply with CBC 1901A.3. Steel stud with expansion anchor requiring a drilled hole; powder driven anchors are not acceptable. Minimum concrete embedment shall be 4-1/2 diameters. Minimum spacing shall be 10 diameters center-to-center and 5 diameters from center to edge of concrete. Maximum allowable stresses for tension and shear shall be 80% of the test report values "with special inspection". Anchors shall be Hilti, Philips - or Approved equal.

2.3 SEISMIC RESTRAINTS

A. All mechanical systems (all equipment, piping, etc.) shall be provided with seismic restraints in accordance with details on the drawings.

2.4 SYSTEM IDENTIFICATION

A. Above Grade Piping: Provide markers on piping which is either exposed or concealed in accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid conveyed or its abbreviation, either by preprinted markers or stenciled marking, and include arrows to show the direction of flow. Comply with ANSI A13.1 for colors. Locate markers at ends of lines, near major branches and other interruptions including equipment in the line, where lines pass through floor, walls or ceilings or otherwise pass into inaccessible spaces, and at 50' maximum intervals along exposed portion of lines. Marking of short branches and repetitive branches for equipment connections is not required.

B. Equipment: All equipment shall be identified with a plastic laminated, engraved nameplate which bears the unit mark number as indicated on the drawings (e.g. AC-1). Provide 1/2" high lettering, white on black background. Nameplates shall be permanently secured to the unit.

C. Valves: Provide valve tags on all valves of each piping system, excluding check valves, valves within equipment, shut-off valves at equipment and other repetitive terminal units. Provide brass tags or plastic laminate tags. Prepare and submit a tagged valve schedule, listing each valve by tag number, location, and piping service. Mount in glazed frame where directed.

D. Controls: Label all panels, thermostats and by-pass timers with plastic laminated, engraved nameplate which bears the unit mark number as indicated on the drawings (e.g. AC-1). Provide 1/4" high lettering, white on black background. Nameplates shall be permanently secured to the unit.

2.5 EQUIPMENT SUPPORT FRAMES

A. Unless specifically noted otherwise, it shall be the responsibility of Mechanical Contractor to furnish and install all support frames for its equipment.

PART 3 EXECUTION

3.1 SCHEDULING OF WORK

A. All work shall be scheduled subject to the approval of the Engineer and Owner. No work shall interfere with the operation of the existing facilities on or adjacent to the site.

3.2 CONDUCT OF WORK

A. The Contractor shall have at all times, as conditions permit, a sufficient force of workmen and quantity of materials to install the work contracted for as rapidly as possible consistent with good work and shall cause no delay to other Divisions engaged upon this project or to the Owner.

B. Mechanical Contractor shall arrange for all cutting necessary for the proper installation of its work, providing all sleeves and chases necessary. Cutting shall not be done in such a manner to impair the strength of the structure. Any damage resulting from work shall be repaired by the Contractor at his expense to the satisfaction of the Engineer.

C. Progressively, daily at the completion of each day's work, and at completion of the job, the Contractor shall thoroughly clean all of his work, removing all debris, stain and marks resulting from his work.

D. IAQ Management plan will be in effect for Cal Green Certification, including the sealing of duct ends before and during rough-in, specific requirements for the use of HVAC equipment during construction (if used at all), building flush-out, etc. Adhesives and mastic must comply with low VOC requirements and documentation (MSDS, etc.) shall be provided with submittals.

3.3 OPENINGS, CUTTING AND PATCHING

A. The locations and dimensions for openings through walls, floors, ceilings, foundations, footings, etc. required to accomplish the work under this Specification Division shall be provided under this Division. The actual openings and the required cutting and patching shall be provided. Coring through existing concrete or masonry walls, floors, ceilings, foundations, footings, etc., and saw cutting of concrete floors or asphaltic concrete required to accomplish the work under this Specification Division shall be provided under this Division. Patching of these surfaces shall also be provided. Cutting and coring shall not impair the strength of the structure. Any damage resulting from this work shall be repaired at the Contractor's expense to the satisfaction of the Engineer.

3.4 MANUFACTURER'S RECOMMENDATIONS

A. All material, equipment, devices, etc., shall be installed in accordance with the recommendations of the manufacturer of a particular item. The Contractor shall be responsible for all installations contrary to the manufacturer's recommendations. The Contractor shall make all necessary changes and revisions to achieve such compliance. Manufacturer's installation instructions shall be delivered to and maintained at the job site through the construction of the project.

3.5 QUIETNESS

A. Piping, ductwork, and equipment shall be arranged and supported so that vibration is a minimum and is not carried to the building structure or spaces.

3.6 DAMAGES BY LEAKS

A. The Contractor shall be responsible for damages to other work caused by leaks in the temporary or permanent piping systems prior to completion of work and during the period of the guarantee, and for damages to other work caused by disconnected pipes or fittings, and the overflow of equipment prior to completion of the work.

3.7 CLEANING

A. Progressively and at completion of the job, the Contractor shall thoroughly clean all of his work, removing all debris, stain and marks resulting from his work.

END OF SECTION 23 00 00

SECTION 23 00 01 HEATING, VENTILATING AND AIR CONDITIONING

PART 1 GENERAL

1.1 GENERAL CONDITIONS

A. The foregoing Section 23 00 00, General Mechanical Provisions, shall form a part of this specification.

1.2 SCOPE

A. Included: Perform all work necessary and required to complete construction as indicated. Such work includes the furnishing of all labor, materials, and services necessary for a complete, lawful, and operating air conditioning, heating, ventilating system with all equipment as shown or noted on the drawings or as specified herein. The work includes, but is not necessarily limited to, the following:
   1. Heating, ventilating and air conditioning equipment.
   2. Air distribution system (Ductwork, Air Terminals, etc.).
   3. Piping systems.
   4. System insulation.

B. Work Specified Elsewhere:
   1. Line voltage power wiring (60 volts or greater), motor starters in motor control centers and disconnect switches are included in the Electrical Section.
   2. Connection of gas and condensate drains to equipment.
   3. Access doors.
   4. Controls, control wiring, and conduit for control wiring.

PART 2 MATERIALS

2.1 DUCTWORK MATERIALS

A. General: All ductwork materials shall have fire and smoke hazard ratings as tested under ASTM E-84 and UL-723 not exceeding a flame spread of 25 and smoke developed of 50. All ductwork shall be per Chapter 6 of the CMC.

B. Low Velocity Metal Ductwork: Metal ductwork shall be galvanized sheet steel, ASTM A653.

C. Low Velocity Flexible Ductwork: Insulated flexible ductwork. Continuous internal liner bonded to galvanized steel wire helix. One pound per cubic foot glass fiber insulation, R-8. Thermal conductivity shall not exceed 0.13 Btu./ hr. sq. ft.-degrees F at a mean temperature of 75°F. Seamless vapor barrier jacket. Each length shall have a factory installed metal sleeve at each end. Duct shall be capable of continuous operation at 1.5" of water static pressure and 4000 ft./ min. air velocity. Maximum length 5 ft., single piece at runouts to air terminals. Genflex, Lamborn or equal.

D. Spiral Duct: Ductwork shall be galvanized steel with uni-seal spiral seamlock and uni-seal fittings, ASTM A653. United McGill Corp. All exposed spiral duct shall be painted, color selected by Owner.

E. Round Duct on Roof: Ductwork shall be double wall insulated galvanized steel with solid welded seam longitudinal seam-K27. United McGill Corp.

F. Bonding Adhesive: Durodyne WBG, Scotchgrip Adhesive 4230, United McGill Uni-Tack.

G. Duct Mastic: Minnesota Mining and Manufacturing Duct Sealer 800, Tuff-Bond No. 12, Glencoat Seal-Flex, United Duct Sealer.

H. Fiber Tape: Mineral impregnated fiber tape and plastic activator - adhesive, Hardcast, Inc., United McGill Uni-Cast or equal.

I. Duct Joints:
1. As an option to joints and seams designated by SMACNA or shown on Drawings, the following systems may be used:
   a. Ducts with sides 24 inches to 48 inches, transverse duct joint system by Ductmate Jr., Nexus or equal (SMACNA "E" Type connection).
   b. Ducts 48 inches and larger, Ductmate Regular, Nexus or equal (SMACNA "J" Type connection).

2.2 AIR TERMINALS AND DUCT FITTINGS

A. Grilles: (Grilles, Registers and Diffusers)
1. Information on Drawings: Refer to the Air Distribution Schedule on the drawings for the list of grilles. Manufacturer's model numbers are listed to complete the description. Equivalent models of Anemostat, J & J, Krueger, Barber-Colman, Price, Environmental Air Products, Titus or equal. Refer to the floor plans for neck size, CFM, air diffusion pattern, and fire damper, if required.
2. Performance: If, according to the certified data of the manufacturer of the proposed units, the sizes indicated on the drawings will not perform satisfactorily, the units shall be reselected by the Contractor for the proper diffusion, spread, drop, and throw.
3. Frame Accessories: All supply, return, and exhaust grilles shall be provided with cushion heads and attachments to structure, unless otherwise noted. All surface mounted grilles shall have a perimeter gasket and flanged edge. All grilles shall have frames suitable for mounting in the surfaces designated by the architectural drawing, coordinate prior to ordering.
4. Finish: All ceilings and wall grilles shall have a paintable white finish unless otherwise noted. Interior components shall be flat black.

B. Turning Vanes: Double wall, hollow metal, air-foil shape. Spacing in accordance with manufacturer's recommendations. Aero Dyne, HEP, or equal.

C. Flexible Connection: UL listed neoprene coated 30-ounce fiberglass cloth. 3" metal, 6" fabric, 3" metal. Ventglas or equal.

D. Fire/ Smoke Damper: Multi-blade construction in accordance with CBC & CMC. UL 555 and UL 555S labels. Blades shall have metal-to-metal seals and not rely on actuator torque to maintain leakage rating. Prefco, Air Balance, Ruskin, Greenheck, or equal power open/ spring close operator or equivalent.

E. Louvers: Refer to the Air Distribution Schedule on the drawings. Manufacturer’s model numbers are listed to complete the description. Equivalent models of Ruskin, Greenheck, Dayton or approved equal. Contractor shall fabricate and provide 16 GA. galvanized perforated panel (50% Free Area) over exterior of all louvers and have field painted to match exterior wall. Refer to the floor plans for all sizes.

2.3 DUCTWORK INSULATION MATERIALS

A. General: All ductwork insulation materials shall have fire and smoke hazard ratings as

tested under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50.

B. Acoustic Lining: Glass fiber. One side coated to prevent fiber erosion up to 6000 ft./ min. Average noise reduction coefficient of 0.90. 0.13 Btu/ hr. – sq. ft. – degrees F conductivity at a mean temperature of 75 degrees F, R-8. CSG Insulation Corp., Schuller, Owens-Corning, Knauf or equal. Duct dimensions shown on drawings for lined duct are clear (net) opening inside of lining.

C. Fiber Glass Blanket: Foil faced,0.13 Btu/ hr. – sq. ft. – degrees F conductivity at a mean temperature of 75 degrees F, R-8. CSG Insulation Corp., Schuller, Owens-Corning, Knauf or equal.

D. Bonding Adhesive: Benjamin Foster 85-15 or equal.

2.4 PIPING MATERIALS

A. Miscellaneous Piping Items:
1. Pipe Support:
   a. Pipe Hanger: Adjustable split ring, swivel hanger and rod. Black malleable iron. Size and maximum loads per manufacturer's recommendations. Felt lined, B-Line B3690F, Unistrut, Superstrut.
   b. Construction Channel: 12 gage 1-5/8" x 1-5/8" steel channel. Single or multiple sections. Self-locking nuts and fittings. B-Line, Unistrut, Superstrut.
2. Pipe Sleeves: 24 gage galvanized steel. Adjus-to-Crete #10 with #99 thimble for floors. #100 for walls.
3. Flashing: Flashing for piping through roof shall be prefabricated 24 gage galvanized steel roof jacks with 8" square flange around pipe. Seal with weatherproofing mastic.

2.5 EQUIPMENT

A. General Requirements:
1. Capacity: Capacities shall be in accordance with schedules shown on drawings. Capacities are to be considered minimum.
2. Dimensions: Equipment must conform to space requirements and limitations as indicated on drawings and as required for operation and maintenance. Where Architectural screening is indicated, equipment shall not extend above or beyond screening. Equipment will not be accepted that does not readily conform to space conditions. Prepare and submit layout drawings for all proposed equipment (different than scheduled units) showing actual job conditions, required clearances for proper operation, maintenance, etc.
3. Ratings:
   c. Electrical: Electrical equipment shall be in accordance with NEMA Standards and UL or ETL listed where applicable standards have been established.
4. Piping: Each item or assembly of items shall be furnished completely piped for connection to services. Control valves and devices shall be provided. Equipment requiring domestic water for non-potable use shall be provided with backflow preventer acceptable for intended use by local governing authorities.
5. Electrical:
   a. General: Each item or assembly of items shall be furnished completely wired to individual terminal blocks for connection to single branch electrical circuit. All electrical accessories and controls required by equipment shall be furnished. Provide terminal blocks for controls and interlocks not included in equipment package. Manual and magnetic starters shall have ambient compensating running overcurrent protection in all ungrounded conductors. Magnetic starters shall be manual reset, shall have H-O-A switches and auxiliary contacts. Controllers and

other devices shall be in NEMA 1 or 3R enclosures as applicable.

b. Wiring: Conductors, conduit, and wiring shall be in accordance with Electrical Specifications. Individual items within assembly shall be separately protected with dead front, fused disconnect, fuse block, or circuit breaker for each ungrounded conductor, all accessible on operating side of equipment. Switches, contacts, and other devices shall be in ungrounded conductors.

c. Motors: Shall be rated, constructed, and applied in accordance with NEMA and ANSI Standards without using service factor. Single-phase motor shall be of type to suit application. Three-phase motors shall be open drip proof, NEMA B design on pumps and fans, NEMA C on reciprocating equipment, sealed ball bearing, three-phase induction unless otherwise noted. Design shall limit starting inrush current and running current to values shown on drawings. Motors 1 horsepower and larger shall be the premium efficiency type, tested according to IEEE Standard 112, Method B. Motors exposed to weather shall be TEFC. Motors in a fan air stream shall be TEFC or TEAO. Vertical motors outdoors shall be ODP or TEFC and shall have rain caps.

d. Starters: Motor starters shall be furnished for all equipment except where starter is in a motor control center as designated on the electrical drawings. Deliver starter to Electrical Contractor for installation and wiring.

e. Control Voltage: Equipment connected to greater than 240 volts shall be provided with 120 volt control circuit from integral protected transformer if separate source is not indicated on plans. 240 volt control is acceptable if confined within control panel.

f. Submittals: Included in shop drawings shall be internal wiring diagrams and manufacturer's recommend external wiring.

6. Fan Selection:

a. Fan Curves: Performance curves shall be submitted for all units of 3000 CFM or greater. Operating point for forward curved fans shall be from point of maximum efficiency towards increased CFM limited by horsepower scheduled. Operating point for backward inclined fans shall be selected near point of maximum efficiency. Curves shall plot CFM verses static pressure with constant brake horsepower, RPM, and efficiency lines.

b. Static Pressure: Unless otherwise noted, pressure scheduled as external static pressure (ESP) includes all ductwork and accessory losses external to the unit housing. Unless otherwise noted, pressure scheduled as total static pressure includes all ductwork, filter, coil, cabinet, damper, and other accessory losses. Unless otherwise noted, pressure scheduled as duct static pressure includes all supply and return ductwork and accessory losses external to the unit housing and plenum (as applicable). The allowance for filter losses is 0.3" WC, unless otherwise noted. Submit itemized static pressure losses for all components.

7. Sound Ratings: Shall be in accordance with ASHRAE 36-72. Sound ratings shall not exceed scheduled values.

8. Drives: Unless noted as direct connected, drives shall be V-belt, rated at 150% of motor horsepower. Multiple drive belts shall be matched set. Drive sheaves shall be dynamically balanced, adjustable, range +/- 10%, selected at mid-range. Adjustable relative movement shall be lockable to shaft. Belts shall be aligned within 1-1/2 degrees at all times. Open drives shall be provided with OSHA approved open mesh belt guards. Belt guards exposed to weather shall be weatherproof enclosure with louvered face for adequate ventilation. Driving motor shall be mounted on adjustable rails. T.B. Woods, Browning. Submit RPM range of driven machine with drive selection.

B. Exhaust Fans:

1. General: All exhaust fans shall be tested and rated in accordance with AMCA Standard 210. Fans exposed to the weather shall have ventilated weatherproof housing over motor and drive assembly.

2. Ceiling Fan: Ceiling mounted direct drive centrifugal exhaust fan with exhaust grille. Motor mounted in rubber-in-shear isolators. Motor and fan removable through grille. Acoustically lined housing. Backdraft damper. UL listed. Greenheck (Lodi USD Standard) or District approved equal.
3. Roof Fan: Multivane centrifugal fan. Ball bearings. Vibration isolation mount. All aluminum curb base. Weatherproof disconnect switch. Down blast type UL listed. Cook, Greenheck, Penn, ACME or equal.

PART 3 EXECUTION

3.1 DUCTWORK INSTALLATION:

A. General:
1. Standards: Unless otherwise noted, all ductwork shall be constructed and installed in accordance with current SMACNA "HVAC Duct Construction Standards." Ductwork and accessories shall be installed in a manner to prevent vibration and rattling.
2. Seismic Bracing: All ducts shall be braced and supported per details on the drawings.
3. Duct Access Doors: Provide access doors as required to adjust equipment and dampers.
4. Flexible Connections: Connections of ductwork to all equipment shall be with 6" (min.) flexible connection. Install with ample slack and uniform gap after deflection of vibration isolators. There shall be no metal to metal contact across flexible connection. Protect outdoor connections with weatherproof metal shroud on top and sides, no metal-to-metal contact. Provide at all seismic joints.
5. Open ends of ductwork shall be covered during construction to keep inside clean.

B. Low Velocity-Low Pressure (up to 2000 ft./ min.; up to 2.0 in. water):
1. Sheet Metal Ductwork:
   a. Ells: Ells with less than standard radius and square ells shall be fitted with turning vanes.
   b. Tees: Tees shall be straight tap-in with extractor or 45 degree takeoff, as shown on drawings.
   c. Duct Joints: Seal duct joints airtight with fibre tape and adhesive per manufacturer's printed instructions. Ducts in weather shall be sealed air and watertight with duct mastic before closing and taping.
      1) Where Ductmate type of joints are used the manufacturer’s, designated procedure shall be followed. Ductmate joints on roof shall have continuous cleat on top duct flange to prevent water from collecting on gasket.
   d. Dampers: Install volume control damper and damper regulator in all branch ducts whether specifically shown on drawings or not.
   e. Duct dimensions shown on drawings for lined ducts are clear net openings inside of lining.
   f. Top of ducts exposed to weather shall be cross broken and sloped slightly to each side to allow rainwater to run off. Ducts that do not drain off top will be rejected and need to be replaced at contractors’ expense.
2. Flexible Glass Fiber Ductwork: Hangers shall be 2" wide metal straps spaced to prevent sagging, 3 feet spacing maximum. Insert 6" wide fiberglass pad between duct and hanging strap. All joints and fittings shall be sheet metal and shall be installed with metal bands or 3 (min.) self-tapping screws and fiber tape. Maximum length of flexible duct shall be 5 ft., single piece minimum length shall be 3 ft. Minimum turn radius shall be in accordance with SMACNA Standards (turn radius to duct centerline not less than 1.5 times the duct diameter).

3.2 AIR TERMINALS AND DUCT FITTINGS INSTALLATION

A. General: Unless otherwise noted, all air terminals and duct fittings shall be installed in accordance with current SMACNA "HVAC Duct Construction Standards", details on drawings and manufacturer's instructions. Terminals and fittings shall be installed in a manner to prevent vibration and rattling.

3.3 DUCTWORK INSULATION INSTALLATION

A. General: All supply and return sheet metal ductwork shall be insulated.

B. Concealed Ductwork: Wrap ductwork with fiberglass blanket lapped 2" minimum. Secure with foil tape at all joints for a complete vapor barrier.

C. Acoustic Lining: All ductwork in equipment rooms, where exposed to weather, and elsewhere as indicated on drawings, shall have acoustic lining (except downstream of final filters). Increase each sheet metal dimension to accommodate lining and maintain clear inside duct dimensions shown on drawings. Apply lining with bonding adhesive in accordance with manufacturer's recommendations and also secure with mechanical fasteners in accordance with SMACNA Standards. Seal exposed edges of lining with bonding adhesive.

3.4 HVAC DUCT CLEANING

A. General: Duct cleaning procedures shall be done per National Air Duct Cleaners Association (NADCA), ACR 2006 Guidelines. Contractor shall thoroughly clean all existing ductwork and grilles to remain shown on drawings with a brush and vacuum system. All workers who may potentially breathe duct contaminants or biocides should wear suitable protective breathing apparatus. Also, workers should look for other types of problems, such as holes or gaps in the ducts. After duct cleaning, a video inspection shall be done for owner review. Inspector to be present during video inspection. The video shall be performed on all ductwork runs with adequate lighting at the camera and adequate reference point, grilles, etc.

B. Work Schedule: All work shall be performed in accordance with the time provisions of the contract. Contractor shall perform work according to a pre-approved schedule with General Contractor, and to complete the work on schedule.

C. Power Vacuum Equipment: Vacuum shall be equipped with final High efficiency Particulate Efficiency (HEPA) filtration to protect surrounding environment from recontamination by disbursement of contaminants removed from air ducts. As an option, contractor may use a collection unit outside of the building. It shall be the contractor's responsibility to remove and dispose of all contaminants from jobsite at contractor's expense.

D. Supervision: All work shall be supervised by an on-site skilled foreman with thorough knowledge and experience in the cleaning of heating, ventilating and air conditioning systems. Supervisor shall have a minimum of 5 years' experience in duct cleaning.

E. Cleaning Process: All ducts shall be cleaned and inspected as work proceeds. Ductwork shall be cleaned by attachment of HEPA power vacuum hose to isolated section of air duct and by combining brushes and reverse air nozzles, to remove all contaminants from the surface of air duct interior. As the brushes and reverse air nozzle are being operated, all contaminants shall be drawn into the HEPA vacuum unit (minimum 5,000 CFM HEPA vacuum to maintain velocity necessary to keep particulate airborne – 3500 FPM). All foreign materials such as dust, mold, soot, lint, bacteria, and other air residues shall be removed from air ducts. Fan powered high efficiency dust and particulate collection units shall be connected to the supply outlets. The collection systems shall be a self-contained

unit, with appropriate components to adequately prevent dirt and debris, loosened from upstream ducts during cleaning operations, from entering the conditioned spaces by capturing this debris within the collection device.

1. Special care and attention shall be given to air ducts having interior lining and a light vacuum process shall be used to prevent damage to air side surfaces. All loose fibrous materials shall be removed by a combination of controlled air pressure and power vacuum.
2. Any major repairs not included in contract shall be brought to the owner's attention.
3. The air handling unit should not be used during the cleaning process. Also, after duct cleaning has been completed, the air handler should be run one (1) hour to allow at least 8 air changes in the area cleaned before being occupied.
4. When gaining access to sheet metal ducts for cleaning use existing duct systems openings where possible. However, where holes need to be cut for access it is essential to seal the access hole properly in order to maintain the integrity of the HVAC system.

F. Clean Up: Contractor shall, at the end of each shift, remove all waste, dirt, and debris, resulting from work performed. Such materials shall be removed from the property and disposed of at the expense of the contractor.

G. Place filter media in all supply diffusers to ensure no contaminants are emitted into areas during cleaning.

H. Cut access panels where necessary by use of sheet metal cutting devise. Access into supply side, then cover with 24 gauge metal gasket seal. Apply sheet metal screws for an airtight seal. Where necessary in concealed attic spaces Contractor will install ceiling access points. Provide gasketed removable access panels at the following locations:

1. Adjacent to turning vanes.
2. Adjacent to dampers (balancing, fire, control, back-draft, splitter, etc.).
3. Upstream of VAV boxes.
4. Next to duct transitions, offsets, and changes of direction.
5. Adjacent to all other in-duct mechanical components and sensors.

I. At any time when ducts are large enough Contractor will enter the ductwork to clean by hand.

J. Wherever the grilles and/ or diffusers are removable, they shall be removed, vacuum cleaned, washed, dried, and then replaced at the original setting. Welded grilles may be cleaned in place.

K. Sanitizing the air distribution network shall be performed as required. Using a suitable atomizing spray wand inserted through the access points, coat all interior surfaces of the duct work with a fine mist of an EPA registered sanitizing fluid: Oxine or equal.

L. Where necessary place plastic covers on all office furnishings and equipment to protect it from dirt and debris.

M. Supply color codes on blueprints to indicate work performed during the last shift.

N. Supply progress report to the Engineer on work completed and work to be performed on a shift by shift basis.

O. Supply M.S.D.S. sheets on all cleaners that are used in the cleaning process.

3.5 EQUIPMENT INSTALLATION

A. General: It shall be the responsibility of the contractor to ensure that no work done under other specification sections shall in any way block, or otherwise hinder access panels or diminish the effectiveness of equipment vibration isolation.

B. Connections to Equipment: Where size reductions are required for connections to equipment, they shall be made immediately adjacent to the equipment and, if possible, inside the equipment cabinet. Connections made to equipment mounted on vibration isolators shall be with flexible connectors, installed adjacent to equipment.

C. Start Up: Engage manufacturer or factory-authorized service representative to perform start up supervision. Manufacturer shall provide on-site start up and commissioning assistance through job completion. Complete installation and start up checks according to manufacturer's written instructions.

3.6 TEMPERATURE CONTROL SYSTEM

A. A. Thermostat shall have the capability of terminating all heating at a temperature of no more than 70°F or terminating all cooling at a temperature of no less than 78°F, and to provide a temperature range of up to 10°F between full heating and full cooling. Thermostats shall be 7 day programmable, Carrier, Robertshaw or equal with sub-base capable of battery backup or capacitor to retain program in the event of a power outage. All control wiring, regardless of voltage, shall be installed in conduit.

3.7 TESTS AND ADJUSTMENTS

A. General: Unless otherwise directed, tests shall be witnessed by a representative of the Architect. Work to be concealed shall not be enclosed until prescribed tests are made. Should any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test, and repair his work and that of other contractors to original conditions. Leaks and defects shown by tests shall be repaired and entire work retested.

3.8 SYSTEM ENERGY BALANCE

A. Scope: Provide the services of a qualified independent test and balance agency certified by the Associated Air Balance Council (AABC) or The National Environmental Balancing Bureau (NEBB) to test, adjust and balance, retest, and record performance of the system to obtain design quantities as specified. Balancing contractor must also be TABB certified and have a C-20 license.

B. Qualifications: Prior to commencing work, the agency shall be approved by the Owner's Representative.

C. Instruments: All instruments shall be accurately calibrated; calibration histories shall be available for examination. Application of instrumentation shall be in accordance with AABC standards.

D. Procedure: General: Balanced quantities shall be plus 5%, minus 5% of design quantities. All name-plate data, manufacturer, model, and serial numbers shall be recorded for each item tested.

E. Extended Warranty: The test and balance agency shall include an extended warranty of 90 days after completion of test and balance work, during which time the Owner's Representative at his discretion may request a recheck or resetting of any item or items in test report. The agency shall provide technicians to assist the Owner's Representative in

making any tests he may require during this period of time.

F. Air Balance Procedure (For Each Air Handling System):
1. All air filters shall be clean when air balance is performed.
2. Provide a sketch of the equipment showing exactly where all pressure readings were taken.
3. Adjust blower RPM to design requirements.
4. Record motor full load amperes.
5. Make pitot tube traverse of main supply and return ducts and obtain design CFM at fans.
6. Record system static pressures, inlet, and discharge.
7. Record filter quantity, size(s) and pressure drop across filter(s) at each filter bank.
8. Adjust system for design CFM recirculated air.
9. Adjust system for design CFM outside air.
10. Record entering air temperatures. (DB heating, DB and WB cooling.)
11. Record leaving air temperatures. (DB heating, DB and WB cooling.)
12. Adjust all main supply and return air ducts to design CFM.
13. Adjust all zones to design CFM, supply, and return.
14. Adjust all diffusers, grilles, and registers to plus 10%, minus 0% of design requirements.
15. Adjust CFM at all exhaust fans, make-up units, etc. (high and low speed, where applicable). Record applicable data from items 1 through 11 above.
16. Each grille, diffuser and register shall be identified as to location.
17. Verify proper diffusion pattern for all ceiling grilles and that all sidewall grilles are set for 5 degrees downward deflection unless otherwise noted. Make a notation of any that are not set properly.
18. Size, type and manufacturer of diffusers, grilles, registers, and all tested items shall be identified and listed. Manufacturer’s ratings shall be used to make required calculations on all items.
19. Readings and tests of diffusers, grilles, and registers shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments.
20. In cooperation with the control manufacturer’s representative, set adjustments of automatically operated dampers to operate as specified. Testing agency shall check all controls for proper calibrations and list all controls requiring adjustment by control installers.
21. All diffusers, grilles and registers shall be adjusted for required air patterns and to minimize drafts.
22. As a part of the work of this contract, THE AIR CONDITIONING CONTRACTOR shall make any changes in pulleys, belts, dampers, or the addition of dampers cleaning of insect screens and replacement of filters required for correct balance as recommended by air balance agency, at no additional cost to Owner.
23. Set, test, and adjust packaged heating/ cooling unit economizer operation in cooperation with controls contractor. Record minimum and maximum outside and exhaust airflows.

END OF SECTION 23 00 01

SECTION 26 05 00 COMMON WORK RESULTS FOR ELECTRICAL

CONDITIONS OF THE CONTRACT AND DIVISION 01, as applicable, apply to this Section.

PART 1 GENERAL

1.1 SUMMARY

A. Provide all work for electrical systems required in the project to be properly installed, tested, and performing their intended function.

1.2 QUALITY ASSURANCE

A. Perform all work in accordance with the latest edition of the California Electrical Code.

B. All electrical materials and distribution, and utilization equipment shall be UL Listed.

C. All equipment and materials shall be new and unused and of United States Domestic manufacture unless approved otherwise by engineer or owner.

D. Eliminate any abnormal sources of noise that are considered by the architect not to be an inherent part of the electrical systems as designed.

1.3 COORDINATION WITH OTHER TRADES

A. Coordinate the work of this division with all other divisions to ensure that all components of the electrical system will be installed at the proper time and fit the available space.

B. Locate and size all openings in work of other trades required for the proper installation of the electrical system components.

C. Make all electrical connections to all equipment furnished by this division and any other division.

D. Make all electrical connections from all 120 volt and greater dampers and switches to associated exhaust fan(s) furnished by any other division.

1.4 DRAWINGS

A. The drawings are schematic in nature but show the various components of the systems approximately to scale and attempt to indicate how they are to be integrated with other parts of the building. Determine exact locations by review of equipment manufacturer's data, by job site measurements, by checking the requirements of other trades, and by reviewing all Contract Documents. The size of the electrical equipment indicated on the Drawings may be based on the dimensions of a particular manufacturer. While other listed manufacturers will be acceptable, it is the responsibility of the Contractor to determine if the equipment that Contractor proposes to furnish will fit in the space. The drawings are not intended to show exact locations of conduit and wire, or to indicate all wire terminators, connectors, conduit fittings, boxes or supports, but rather to indicate distribution, circuitry, and control.

B. The Electrical Drawings are necessarily diagrammatic in character and cannot show every connection in detail or conduit in its exact location. These details are subject to the requirements of ordinances and also structural and architectural conditions. The Contractor shall carefully investigate structural and finish conditions and shall coordinate the separate

trades in order to avoid interference between the various phases of work. Work shall be laid out so that it will be concealed in furred chases and suspended ceilings, etc., in finished portions of the building, unless specifically noted to be exposed. Work shall be installed to avoid crippling of structural members. All exposed work shall be installed parallel or perpendicular to the lines of the building unless otherwise noted.

C. When the mechanical and electrical Drawings do not give exact details as to the elevation of pipe, conduit, and ducts, physically arrange the systems to fit in the space available at the elevations intended with the proper grades for the functioning of the system involved. Exposed conduit is generally intended to be installed true and square to the building construction and located as high as possible against the structure in a neat and workmanlike manner. The Drawings do not show all required offsets and their location details. Work shall be concealed in all finished areas.

1.5 SUBMITTALS

A. Specification Review:
   1. Include a paragraph-by-paragraph written specification review for each product listed requiring a submittal. Denote any proposed deviations from specifications.

1.6 EXISTING CONDITIONS

A. Do all work required to maintain electrical services to the Owner occupied portions of the building during construction.

B. No connection to existing services or utilities shall be made without Owner's knowledge and permission. All such connections shall be planned and scheduled to minimize the length of service interruption required. Request for shutdown shall be made to Owner at least two (2) weeks in advance and shall be accompanied by detailed written schedule of activities during shutdown and list of materials required for connection and renewal of service. It shall be understood that all such service interruptions shall be made at the Owner's convenience, not the Contractor's. No increase in contract amount will be allowed for reasons of premium time, inefficiency of operations or other considerations not calculated in original bid.

C. All items removed shall be stored on-site. Schedule a review of the items with the Owner. Remove from site all items the Owner does not choose to keep. Deliver Owner designated items to Owner's storage facility.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

C. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

PART 2 EXECUTION

2.1 EXISTING WORK

A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

B. Provide temporary wiring and connections to maintain existing systems in service during construction.

C. When performing work on energized equipment or circuits, use personnel experienced and trained in similar operations.

D. Remove, relocate, and extend existing installations to accommodate new construction.

E. Repair adjacent construction and finishes damaged during demolition and extension work.

2.2 OWNER INSTRUCTION

A. Provide on-site Owner training for all new equipment.

B. Use Operation and Maintenance manuals and actual equipment installed as basis for instruction.

C. At conclusion of on-site training program have Owner personnel sign written certification they have completed training and understand equipment operation. Include copy of training certificates in final Operation and Maintenance manual submission.

D. Supply record drawings to the district in PDF and the latest version of AutoCAD.

END OF SECTION 26 05 00

SECTION 26 05 01 SELECTIVE ELECTRICAL DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Divisions 01 Specification Sections, apply to this section.

1.2 SUMMARY

A. This section includes:
   1. Electrical demolition.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work shall be as specified in individual sections.

PART 3 EXECUTION

3.1 EXAMINATION

A. Contractor to walk job to observe existing conditions and account for variance as needed.

B. Verify field measurements and circuiting arrangements as shown on drawings.

C. Verify that abandoned wiring and equipment serve only abandoned facilities.

3.2 PREPARATION

A. Disconnect electrical systems as required under this contract.

B. Coordinate work with the District. No demolition work shall begin without the District's approval.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, observe provisions of NFPA 70E and CALOSHA, use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 48 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area as required.

E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted, or alternate arrangements have been made with owner (e.g. – Fire Watch). Disable system only to make switchovers and connections. Coordinate outages with Owner and local fire service. Notify Owner/Owner's representative at least 48 hours before partially

or completely disabling system. Minimize outage duration. Make temporary connections to

maintain service in areas adjacent to work area.

F. Existing Telephone System: Maintain existing system in service until new system is complete and ready for service. Disable system to make switchovers and connections. Notify Owner at least 48 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Demolish and extend existing electrical work under provisions of this section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Electrical Contractor is responsible for demolished electrical materials, and shall remove from the site and dispose properly or recycle.

D. Remove abandoned wiring to source of supply.

E. Remove exposed abandoned conduit. Cut conduit flush with walls and floors, and patch surfaces as required to match existing.

F. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.

G. Disconnect and remove abandoned panelboards and distribution equipment.

H. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

I. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

J. Discarded electrical components and lamps containing hazardous waste (i.e., mercury in fluorescent lamps) shall be disposed of as required by the State Laws and Local Ordinances regarding hazardous materials.

K. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

L. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.4 INSTALLATION

A. Install relocated and replacement materials and equipment as shown.

END OF SECTION 26 05 01

SECTION 26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section

1.2 SUMMARY

A. Section includes:
1. Wires and cables rated for 600 volts or less.
2. Connectors, splices, and terminations rated for 600 volts or less.
3. Lugs and pads rated for 600 volts or less.

B. System Description:
1. Provide wires, cables, connectors, lugs, strain reliefs, racking insulators for a complete and operational electrical system.

C. Reference Standards:
1. California Electrical Code (CEC) based on NFPA 70 (NEC). California Code of Regulations, Title 24, Part 3.
2. National Electrical Manufacturers Association (NEMA):
   a. WC 70 Power Cables Rated 2,000 V or Less for the Distribution of Electrical Energy.
3. National Electrical Testing Association (NETA):
   a. ATS Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
4. Underwriters Laboratories, Inc. (UL):
   a. 83 UL Standard for Safety Thermoplastic-Insulated Wires and Cables.
   b. 486 Standard for Wire Connectors.
5. American Society for Testing and Materials (ASTM):
   a. B1 Standard Specification for Hard-Drawn Copper Wire.
   b. B3 Standard Specification for Soft or Annealed Copper Wire.
   c. B8 Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.

1.3 SUBMITTALS

A. Provide product data for the following equipment:
1. Wires.
2. Cables.
3. Connectors.
4. Lugs.
5. Splice Kits.

B. Provide the insulation cable testing report in the project closeout documentation, refer to Closeout Requirements in the General Conditions portion of this specification.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Confirm to requirements of the CEC, latest adopted version.

2. Furnish products listed by UL or other testing firm acceptable to AHJ.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Wires and Cables:
1. Southwire Company
2. Encore Wire Corporation
3. Cerro Wire and Cable Co.
4. General Cable Corp.; a brand of Prysmian Group
5. Okonite Co.
6. Alan Wire
7. LS Cable and System USA
8. American Wire and Cable

B. Connectors:
1. FCI Burndy Corp.
2. Cooper Crouse Hinds.
3. O.Z./ Gedney Co.
4. Thomas & Betts Co.
5. 3-M Co.
6. Ideal Industries Co.
7. Polaris Electrical Connectors
8. ILSCO

C. Wire connectors shall be minimum 75 degree centigrade rated and properly sized for the number of conductors being connected, terminated, spliced etc. All above grade connectors shall be solderless lug or plastic wire nut type, screw on, pressure cable type (wire nut or spring nut type), 600 Volt, 105-degree C, with skirt to cover all portions of stripped wires. Connector shall be U.L. rated for number and size of conductors being joined together as a splice.

D. Splices:
1. Branch Circuit Splices: Ideal, Scotch-Lock, 3M, or approved.
2. Feeder Splices: Compression barrel splice with two layers Scotch 23 and four layers of Scotch 33+ as vapor barrier.
3. Screw Terminal Lugs.
4. Kearney Split Bolt.

2.2 WIRES AND CABLES FOR LINE VOLTAGE SYSTEM AND CONTROLS.

A. Wire and Cable Shall Be:
1. Copper, 600 volt rated throughout. Conductors 12AWG to 10AWG, solid or stranded. Conductors 8AWG and larger, stranded.
2. Phase color to be consistent at all feeder terminations; A-B-C, top to bottom, left to right, front to back. Phasing tape shall be permitted on sizes #6 and larger.

B. Each phase wire shall be uniquely color-coded as indicated below:
1. 120/ 240 Volts
   Phase A – Black
   Phase B – Red
   Neutral – White
   Ground – Green
2. 120/ 208 Volts

Phase A – Black
Phase B – Red
Phase C – Blue
Neutral – White
Ground – Green

3. 277/ 480 Volts
   Phase A – Brown
   Phase B – Orange
   Phase C – Yellow
   Neutral – White or Natural Gray
   Ground – Green
4. Isolated Grounds: Green with Yellow Stripes

C. All conductors shall be copper unless otherwise noted. Minimum size for individual conductors shall be #12 AWG unless otherwise noted. Sizes #8 AWG and larger shall be stranded conductor. Individual conductors shall be insulated with type, XHHW, THW, THHN/ THWN 600- volt insulation unless otherwise noted. Control, signal, communication conductors shall be as dictated by the vendor of that equipment or as specified here-in. Proper insulation type shall be used for the proper environmental application (i.e., waterproof, wet location, plenum, temperature rated). If a condition exists where the application is uncertain, contact the Engineer for direction. Contractor is responsible to follow specific cabling requirements described in other sections of this specification relative to various communications and controls systems as well as the respective riser diagrams shown on plans. If a discrepancy occurs, communicate such discrepancy to the Architect and Engineer immediately for resolution.

D. Insulation types THWN, THHN or XHHW. Minimum insulation rating of 90C for branch circuits.

E. Refer to signal and communications specification sections for cable requirements.

2.3 CONNECTORS

A. Copper Pads: Drilled and tapped for multiple conductor terminals.

B. Lugs: Indent/ compression type for use with stranded branch circuit or control conductors.

C. Solid Conductor Branch Circuits: Spring connectors, wire nuts, for conductors 12 through 8AWG.

2.4 LUGS AND PADS

A. Ampacity: Cross-sectional area of pad for multiple conductor terminations to match ampere rating of panelboard bus or equipment line terminals.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation: Conductors shall not be installed until after conduit systems are permanently in place. Use an approved non-hardening type wire pulling lubricant if lubricant is to be used. Maintain all conduits and wire pulls free from foreign material. If due to field conditions, more than a total of 300 degrees of bend are required; a pull box shall be furnished and installed for ease of installation. Said pull boxes must be sized and rated for the appropriate application and must remain easily accessible upon completion of the project (approval of

the location shall be obtained from the Architect prior to installation). Show these pullboxes on the field record drawings. Conductors installed in underground raceways on site shall be duct sealed and taped where they exit the raceway to prevent the entrance of foreign material and moisture after the conductors are installed. Proper drainage shall be provided for underground pull and splice boxes.

B. Insulation: Use proper insulation types where temperature and environment are a factor.

C. Labeling: All conductors in panels, switchboards, terminal cabinets, vaults, pull boxes, and junction boxes shall be labeled with tape number markers indicating circuit number and identifying system. All labeling shall be permanent. See Section 26 05 53: Identification of Electrical Systems.

D. All conductors, wiring, cable where installed below floor, slab or underground shall be considered wet locations, and shall be rated accordingly. Non-waterproof cabling is not allowed in any below grade or wet application.

E. Cables routed together in cable tray shall be stacked, organized and tie wrapped together in a neat and workman like manner. Random cable routing is not acceptable.

F. Cable and conductors routed through pull boxes and vaults shall be properly supported. Bend radius of cable or conductor shall not be less than six times the overall cable diameter.

G. Wires and Cables:
   1. Conductor Installation:
      a. Install conductors in raceways having adequate, code size cross-sectional area for wires indicated.
      b. Install conductors with care to avoid damage to insulation.
      c. Do not apply greater tension on conductors than recommended by manufacturer during installation.
      d. Use of pulling compounds is permitted. Clean residue from exposed conductors and raceway entrances after conductor installation.
   2. Conductor Size and Quantity:
      a. Install no conductors smaller than 12AWG unless otherwise shown (e.g. – Fire alarm and communications systems, as defined in their respective specifications sections and/ or drawings).
      b. Provide all required conductors for a fully operable system.
   3. Provide dedicated neutrals (one neutral conductor for each phase conductor). Exceptions may only be granted with Electrical Engineer approval.
   4. Conductors in Cabinets:
      a. Cable and train all wires in panels and cabinets for power and control neatly and uniformly. Use plastic ties in panels and cabinets.
      b. Tie and bundle feeder conductors in wireways of panelboards.
      c. Hold conductors away from sharp metal edges.

3.2 FIELD QUALITY CONTROL

A. Field inspection and test shall be performed under provisions of NETA ATS section 7.3 (2) - Low Voltage Cables, 600-Volt Maximum as follows:
   1. Visual and Mechanical Inspection:
      a. Compare cable data with drawings and specifications.
      b. Inspect exposed sections of cable for physical damage and correct connection in accordance with single-line diagram.
      c. Inspect all bolted electrical connections for high resistance using one of the following methods:
         1) Use of low-resistance ohm-meter in accordance with NETA section 7.3.2.2

(Electrical Tests).

2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data from NETA ATS Table 10.12.

d. Inspect compression-applied connectors for correct cable match and indentation.
e. Verify cable color coding with applicable specifications and CEC.

2. Electrical Tests
   a. Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential shall be 500 volts dc for 300 volt rated cable and 1000 volts dc for 600 volt rated cable. Test duration shall be one minute.
   b. Perform resistance measurements through all bolted connections with low-resistance ohmmeter, if applicable, in accordance with Section 7.3.2.1 (Visual and Mechanical Inspection).
   c. Perform continuity test to insure correct cable connection.
   d. Correct malfunctions and/ or deficiencies immediately as detected at no additional cost to the District, including additional verification testing.
   e. Subsequent to final wire and cable terminations, energize all circuitry and demonstrate functional adequacy in accordance with system requirements.
3. Test Values
   a. Compare bolted connection resistance to values of similar connections.
   b. Bolt-torque levels should be in accordance with NETA ATS Table 10.12 unless otherwise specified by the manufacturer.
   c. Micro-ohm or milli-volt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer’s published data. If manufacturer’s data is not available, investigate any values which deviate from similar connections by more than 50 percent of the lowest value.
   d. Minimum insulation-resistance values should not be less than 50 meg-ohms.
   e. Investigate deviations between adjacent phases.

END OF SECTION 26 05 19

SECTION 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section Includes:
   1. Grounding and bonding requirements of electrical installations for personnel safety and to provide a low impedance path for possible ground fault currents as described in CEC Article 250.
   2. “Grounding electrode system” refers to all electrodes required by CEC, as well as including made, supplementary, lightning protection system and telecommunications system grounding electrodes.
   3. The terms “connect” and “bond” are used interchangeably in this specification and have the same meaning.

B. Related Sections:
   1. Section 26 05 00: Common Work Results for Electrical.
   2. Section 26 05 19: Low-Voltage Electrical Power Conductors and Cables.

C. Reference Standards:
   1. California Electrical Code (CEC) based on NFPA 70. California Code of Regulations, Title 24, Part 3.
   2. Institute of Electrical and Electronics Engineers (IEEE):
      a. 81 IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System.
      b. 142 Recommended Practice for Grounding of Industrial and Commercial Power Systems.
      c. 1100 Recommended Practice for Powering and Grounding Electronic Equipment
   3. National Electrical Testing Association (NETA):
      a. ATS Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems
   4. Underwriters Laboratories, Inc. (UL):
      a. 83 UL Standard for Safety Thermoplastic-Insulated Wires and Cables.
      b. 467 Grounding and Bonding Equipment.
   5. American Society for Testing and Materials (ASTM):
      a. B1 Standard Specification for Hard-Drawn Copper Wire.
      b. B3 Standard Specification for Soft or Annealed Copper Wire.
      c. B8 Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING CONDUCTORS

A. Equipment grounding conductors shall be UL 83 insulated stranded copper, except that sizes No. 10 AWG and smaller shall be solid copper. Insulation color shall be continuous green for all equipment grounding conductors, except that wire sizes No. 4 AWG and larger shall be permitted to be identified per CEC.

B. Bonding conductors shall be ASTM B8 bare stranded copper, except that sizes No. 10 AWG and smaller shall be ASTM B1 solid bare copper wire.

C. Conductor sizes shall not be less than what is shown on the drawings and not less than required by the CEC, whichever is greater.

2.2 SPLICES AND TERMINATION COMPONENTS

A. Components shall meet or exceed UL 467 and be clearly marked with the manufacturer, catalog number, and permitted conductor size(s).

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper; 3/4 inch by 10 feet (19 mm by 3 m).

B. Ground Plates: 1/4 inch (6 mm) thick, hot-dip galvanized.

C. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes shall be at least 12 inches (300 mm) deep, with cover.
   1. Install at least one test well for each service unless otherwise indicated. Install the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

PART 3 EXECUTION

3.1 GENERAL

A. Ground in accordance with the CEC, as shown on drawings, and as hereinafter specified.

B. System Grounding:
   1. Secondary service neutrals: Ground at the supply side of the secondary disconnecting means and at the related transformers.
   2. Separately derived systems (transformers downstream from the service entrance): Ground the secondary neutral.

C. Equipment Grounding: Metallic structures (including ductwork and building steel), enclosures, fire sprinklers, plumbing piping, raceways, junction boxes, outlet boxes, cabinets, machine frames, and other conductive items in close proximity with electrical circuits shall be bonded and grounded.

3.2 INACCESSIBLE GROUNDING CONNECTIONS

A. Make grounding connections which are buried or otherwise normally inaccessible (except connections for which periodic testing access is required) by exothermic weld.

3.3 SECONDARY EQUIPMENT AND CIRCUITS

A. Main Bonding Jumper: Bond the secondary service neutral to the ground bus in the service equipment.

B. Metallic Piping, Building Steel, and Supplemental Electrode(s):
   1. Provide a grounding electrode conductor sized per CEC between the service equipment ground bus and all metallic water and gas pipe systems, building steel, and supplemental or made electrodes. Jumper insulating joints in the metallic piping. All connections to electrodes shall be made with fittings that conform to UL 467.

2. Provide a supplemental ground electrode and bond to the grounding electrode system.

C. Service Disconnect: Provide a ground bar bolted to the enclosure with lugs for connecting the various grounding conductors.

D. Switchgear, Switchboards, and Motor Control Centers:
1. Connect the various feeder equipment grounding conductors to the ground bus in the enclosure with suitable pressure connectors.
2. For service entrance equipment, connect the grounding electrode conductor to the ground bus.
3. Connect metallic conduits, which terminate without mechanical connection to the housing, by grounding bushings and grounding conductor to the equipment ground bus.

E. Transformers:
1. Exterior: Exterior transformers supplying interior service equipment shall have the neutral grounded at the transformer secondary. Provide a grounding electrode at the transformer.
2. Separately derived systems (transformers downstream from service equipment): Ground the secondary neutral at the transformer. Provide a grounding electrode conductor from bar at the service equipment.

F. Conduit Systems:
1. Ground all metallic conduit systems. All metallic conduit systems shall contain an equipment grounding conductor sized per CEC.
2. Nonmetallic conduit systems shall contain an equipment grounding conductor, except that non-metallic feeder conduits which carry a grounded conductor from exterior transformers to interior or building-mounted service entrance equipment need not contain an equipment grounding conductor.
3. Metal conduit containing only a grounding conductor, and which is provided for mechanical protection of the conductor, shall be bonded to that conductor at the entrance and exit from the conduit.

G. Feeders and Branch Circuits: Install equipment grounding conductors with all feeders, power, and lighting branch circuits.

H. Boxes, Cabinets, Enclosures, and Panelboards:
1. Bond the equipment grounding conductor to each pullbox, junction box, outlet box, device box, cabinets, and other enclosures through which the conductor passes.
2. Provide lugs in each box and enclosure for equipment grounding conductor termination.
3. Provide ground bars in panelboards, bolted to the housing, with sufficient lugs to terminate the equipment grounding conductors.

I. Motors and Starters: Provide lugs in motor terminal box and starter housing or motor control center compartment to terminate equipment grounding conductors.

J. Receptacles shall not be grounded through their mounting screws. Ground with a jumper from the receptacle green ground terminal to the device box ground screw and the branch circuit equipment grounding conductor.

K. Ground lighting fixtures to the equipment grounding conductor of the wiring system when the green ground is provided; otherwise, ground the fixtures through the conduit systems. Fixtures connected with flexible conduit shall have a green ground wire included with the power wires from the fixture through the flexible conduit to the first outlet box.

L. Fixed electrical appliances and equipment shall be provided with a ground lug for termination of the equipment grounding conductor.

3.4 CONDUCTIVE PIPING

A. Bond all conductive piping systems, interior and exterior, to the building to the grounding electrode system. Bonding connections shall be made as close as practical to the equipment ground bus.

3.5 TELECOMMUNICATIONS SYSTEM

A. Bond telecommunications system grounding equipment to the electrical grounding electrode system. Refer to communications backbone cabling specification section.

3.6 GROUND RESISTANCE

A. Grounding system resistance to ground shall not exceed 15 ohms. Make necessary modifications or additions to the grounding electrode system for compliance without additional cost to the Owner. Final tests shall assure that this requirement is met, and test results shall be submitted to the Owner with final close out documents.

B. Resistance of the grounding electrode system shall be measured using a four-terminal fall-of- potential method as defined in IEEE Standard 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

C. Below-grade connections shall be visually inspected by the Inspector of Record (IOR) prior to backfilling. The Contractor shall notify the IOR 24 hours before the connections are ready for inspection.

D. Furnish a copy of tests to Owner at completion of project.

END OF SECTION 26 05 26

SECTION 26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

CONDITIONS OF THE CONTRACT AND DIVISION 01, as applicable, apply to this Section.

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Conduit supports.
2. Formed steel channel.
3. Spring steel clips.
4. Sleeves.
5. Mechanical sleeve seals.
6. Firestopping relating to electrical work.
7. Firestopping accessories.
8. Equipment bases and supports.

1.2 REFERENCES

A. Underwriters Laboratories Inc.:
1. UL 263 - Fire Tests of Building Construction and Materials.
2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
3. UL 1479 - Fire Tests of Through-Penetration Firestops.
4. UL - Fire Resistance Directory.

1.3 DEFINITIONS

A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 PERFORMANCE REQUIREMENTS

A. Firestopping: Conform to Building Code and UL for fire resistance ratings and surface burning characteristics.

1.5 SUBMITTALS

A. Product Data:
1. Hangers and Supports: Submit manufacturers catalog data including load capacity.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with the Building Code.

PART 2 PRODUCTS

2.1 CONDUIT SUPPORTS

A. Manufacturers:
1. Allied Tube & Conduit Corp.
2. Electroline Manufacturing Company.

3. O-Z Gedney Co.
4. Appleton.

B. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.

C. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.

D. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.

E. Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.

F. Cable Ties: High strength nylon temperature rated to 185 degrees F. Self-locking. With Stainless tooth.

2.2 FORMED STEEL CHANNEL

A. Manufacturers:
1. Allied Tube & Conduit Corp.
2. B-Line Systems.
3. Midland Ross Corporation, Electrical Products Division.
4. Unistrut Corp.

B. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

2.3 SLEEVES

A. Sleeves for raceway Through Non-fire Rated Floors: 18 gage galvanized steel.

B. Sleeves for raceway Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage galvanized steel.

C. Sleeves for raceway Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL Listed.

D. Fire-stopping Insulation: Glass fiber type, non-combustible.

2.4 SPRING STEEL CLIPS

A. Product Description: Mounting clamp, and screw.

2.5 MECHANICAL SLEEVE SEALS

A. Manufacturers:
1. Thunderline Link-Seal, Inc.
2. NMP Corporation.

B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.6 FIRESTOPPING

A. Manufacturers:
   1. Dow Corning Corp.
   2. Fire Trak Corp.
   3. Hilti Corp.
   4. International Protective Coating Corp.
   5. 3M fire Protection Products.
   6. Specified Technology, Inc.

B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
   1. Silicone Firestopping Elastomeric Firestopping: Multiple component silicone elastomeric compound and compatible silicone sealant.
   2. Foam Firestopping Compounds: Multiple component foam compound.
   3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
   4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
   5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
   6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
   7. Firestop Pillows: Formed mineral fiber pillows.

2.7 FIRESTOPPING ACCESSORIES

A. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

B. General:
   1. Furnish UL Listed products.
   2. Select products with rating not less than rating of wall or floor being penetrated.

C. Non-Rated Surfaces:
   1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where conduit is exposed.
   2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify openings are ready to receive sleeves.

B. Verify openings are ready to receive firestopping.

3.2 INSTALLATION - HANGERS AND SUPPORTS

A. Anchors and Fasteners:
   1. Concrete Structural Elements: Provide precast inserts, expansion anchors, powder actuated anchors or preset inserts as required.
   2. Steel Structural Elements: Provide beam clamps, spring steel clips, steel ramset

fasteners or welded fasteners as required.
3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors as required.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts or hollow wall fasteners as required.
5. Solid Masonry Walls: Provide expansion anchors or preset inserts as required.
6. Sheet Metal: Provide sheet metal screws.
7. Wood Elements: Provide wood screws.

B. Inserts:
1. Install inserts for placement in concrete forms.
2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over four (4) inches.
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

C. Install conduit and raceway support and spacing in accordance with CEC.

D. Do not fasten supports to suspended ceiling support system, pipes, ducts, mechanical equipment, or conduit.

E. Install multiple conduit runs on common hangers.

F. Supports:
1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface mounted cabinets and panelboards with minimum of four anchors.
3. In wet and damp locations install steel channel supports to stand cabinets and panelboards one (1) inch off wall.
4. Support vertical conduit at every floor.

3.3 INSTALLATION - FIRESTOPPING

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit, and other items, requiring firestopping.

B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.

C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating.

D. Compress fibered material to maximum 40 percent of its uncompressed size.

E. Place intumescent coating in sufficient coats to achieve rating required.

F. Remove dam material after firestopping material has cured.

G. Fire Rated Surface:
1. Seal opening at all rated floors and walls as follows:
   a. Install sleeve through opening and extending beyond minimum of one (1) inch on both sides of building element.
   b. Size sleeve allowing minimum of one (1) inch void between sleeve and building

element.
c. Pack void with backing material.
d. Seal ends of sleeve with UL Listed fire resistive silicone compound to meet fire rating of structure penetrated.
2. Where cable tray, bus, or conduit, penetrates fire rated surface, install firestopping product ins accordance with manufacturer's instructions.

H. Non-Rated Surfaces:
1. Seal opening through non-fire rated floors and walls as follows:
a. Install sleeve through opening and extending beyond minimum of one (1) inch on both sides of building element.
b. Size sleeve allowing minimum of one (1) inch void between sleeve and building element.
c. Install type of firestopping material recommended by manufacturer.
2. Install escutcheons where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
3. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, in accordance with manufacturer's instructions.

3.4 INSTALLATION - SLEEVES

A. Exterior watertight entries: Provide mechanical sleeve seals.

B. Interior conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.

C. Set sleeves in position in forms. Provide reinforcing around sleeves.

D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

E. Extend sleeves through floors and walls one (1) inch above finished floor level. Caulk sleeves.

END OF SECTION 26 05 29

SECTION 26 05 33 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Conduit and fittings.
2. Outlet boxes.
3. Weatherproof outlet boxes.
4. Junction and pull boxes.
5. Floor boxes.
6. Cabinets, termination cabinets.
7. Gutters.

1.3 SUBMITTALS

A. Provide Product Data for the Following Equipment:
1. Conduit and fittings.
2. Outlet boxes.
3. Weatherproof outlet boxes.
4. Junction and pull boxes.
5. Floor boxes.
6. Cabinets, termination cabinets.
7. Gutters.
8. Putty pads.
9. Raceways

B. Submit detailed conduit routing plan, for review and approval, prior to installation as follows:
1. Exposed and/ or concealed in building walls for conduits larger than 2-inch outside diameter.
2. All underground conduits (3/4-inch and larger) in duct bank; concealed in floor slabs, equipment pads and concrete slabs.

1.4 SUBMITTALS

A. Minimum acceptable conduit sizes are summarized in the following table:

	Minimum Size
Underground, site wiring	1”
Underground • Building Wiring Aboveground • Equipment or panel feeders • Telecommunications	3/4"
Aboveground • Lighting or branch circuit wiring • Fire alarm • Security	1/2”

Other	3/4”

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Conform to requirements of the CEC, latest adopted version.
   2. Furnish products listed by UL or other independent and nationally recognized testing firm.

1.6 DELIVERY, STORAGE AND HANDLING

A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

B. Protect PVC and PVC-coated metallic conduit from sunlight.

C. Protection of and cleanliness of pathways and raceways must be assured during the construction process in order to eliminate the possibility of debris entering the conduit, duct, pathway resulting in decreased wire capacity and potential damage to installed conductors and cables.

PART 2 PRODUCTS

2.1 MATERIALS

A. Polyvinyl Chloride (PVC) coated galvanized rigid steel conduit and intermediate metal conduit shall be in accordance with NEMA RN 1. Coating shall be applied under controlled factory conditions. Prior to coating, conduit shall meet requirements of ANSI C80.1 and UL 6 or ANSI C80.6 and UL 1242 as appropriate. PVC coated conduits shall have ultra-violet (UV) inhibitor in the coating material.

B. Intermediate Metal Conduit (IMC). Raceway shall be hot dipped galvanized mild steel in accordance with ANSI C80.6 and UL 1242 and shall bear the UL label. Conduit shall have same characteristics of rigid steel except for thinner wall.

C. Galvanized Rigid Steel Conduit (GRSC or RGS), couplings and elbows shall be hot dip galvanized, rigid mild steel in accordance with ANSI C80.1 and UL 6. The conduit interior and exterior surfaces shall have a continuous zinc coating with a transparent overcoat of enamel, lacquer, or zinc chromate. Conduit shall be formed with continuous welded seams with a uniform wall thickness, in minimum 10-foot lengths, with threaded ends.

D. Electrical Metallic Tubing (EMT). Electrical metallic tubing, including elbows and bends, shall be zinc coated, mild steel in accordance with the requirements of ANSI C80.3 and UL 797. The interior and exterior surfaces of the tubing shall have a continuous zinc coating. Conduit shall be formed with a continuous welded seam, with a uniform wall thickness, in minimum 10-foot lengths.

E. Non-Metallic Conduit shall be as follows:
   1. Schedule 40: Conduit shall be 90 degree Celsius, polyvinyl chloride in conformance with NEMA TC-2 and UL 651 requirements.
   2. Spacers used in duct bank installations shall be high impact plastic, interlocking bases, and intermediate type spacers. Place spacers between 6 and 10 feet apart.

F. Flexible Metal Conduit shall be galvanized steel meeting the requirements of UL 1. Flexible

aluminum conduit is not permitted.

G. Liquid-Tight Flexible Metal Conduit shall be plastic jacketed, galvanized steel, "Sealtite" Type EF for general service areas or Type HC for high temperature when used under raised floor or in air plenums. Conduit shall be UL listed.

H. Manufacturers:
1. Outlet Boxes: Bowers, Raco, Orbit, Steel City or equal.
2. Weatherproof Outlet Boxes: Bell, Red Dot, Carlon or equal.
3. Floor Boxes: Wiremold/ Walker, Hubbell, Steel City, or equal.
4. Junction and Pull Boxes: Circle AW, Hoffman, Wireguard or equal.
5. Box Extension Adapter: Bell, Red Dot, Carlon or equal.
6. Conduit Fittings: O-Z Gedney, Thomas & Betts, Raco, Crouse Hinds, or equal.
7. Putty pads: 3M, Hilti, or equal.
8. Heavy wall rigid non-metallic conduit, Carlon, Certainteed, R&G Sloane or equal.
9. Extra heavy wall non-metallic conduit, Carlon, Certainteed, R&G Sloane or equal.
10. Flexible Metal Conduit (FMC), Alflex, American Flexible Conduit or equal.
11. Liquid tight flexible metal conduit, Anacanda (type UA), Electri-flex Liquatite or equal.
12. Floor Boxes, Single Gang, Walker/ Wiremold 880 CS Series or approved equal.
13. Floor Boxes, Multiple Gang, Walker/ Wiremold RFB Series or Walker Omnibox multi-service floor box with carpet plates, and/ or water resistant device covers.
14. Masonry Boxes, outlets in concrete, Raco Series 690 or equal.

I. Listed products for termination, coupling, extending, benching supports of raceways shall be used.

2.2 OUTLET BOXES

A. NEMA 1 gutter, junction and pull boxes shall be fabricated from code gage steel finished in grey enamel with screw cover fronts and concentric knockouts in all sides.

B. NEMA 3R gutter, junction and pull boxes shall be fabricated from code gage galvanized steel with screw cover fronts and concentric knockouts in the bottom only. Any penetrations to the side, top or back shall be weatherproofed in an approved manner such as “MYERS” gasketed type hub or equal.

C. Steel outlet boxes and plaster rings shall be galvanized rigid assemblies, either one piece pressed or factory welded construction containing the size and number of knockouts required. Steel outlet boxes shall be manufactured, sized and installed in accordance with CEC Article 314. Device Outlet: Installation of one or two devices at common location, minimum 4” square, minimum 1-1/2" deep. Single or 2 gang flush device plaster ring. Raco or equal.

D. Luminaire Outlet: minimum 4” square with correct plaster ring depth, minimum 1-1/2” deep with 3/8” luminaire stud if required. Provide proper depth plaster ring on bracket outlets and on ceiling outlets.

E. Construction: Provide galvanized steel interior outlet wiring boxes, of the type, shape and size, including depth of box, to suit each respective location and installation; constructed with stamped knockouts in back and sides, and with threaded holes with screws for securing box covers or wiring devices. Boxes shall be properly secured to the structure such that they are flush with the finish surface. Boxes shall be made structurally secure by means of the proper fastening devices.

F. Accessories: Provide outlet box accessories as required for each installation, including

mounting brackets, wallboard hangers, extension rings, plaster rings, luminaire studs, cable clamps and metal straps for supporting outlet boxes, compatible with outlet boxes being used and meeting requirements of individual wiring situations.

2.3 JUNCTION AND PULL BOXES

A. Construction: Provide galvanized sheet steel junction and pull boxes, with screw-on covers; of the type shape and size, to suit each respective location and installation; with welded seams and equipped with steel nuts, bolts, screws and washers.

B. Location:
1. Install junction boxes above accessible ceilings for drops into walls for receptacle outlets from overhead.
2. Install junction boxes and pull boxes as required to facilitate the installation of conductors and limiting the accumulated angular sum of bends between boxes, cabinets and appliances to 300 degrees.
3. Locations: Junction boxes shall be located only where necessary and only in equipment rooms, closets, and accessible attic and underfloor spaces. A horizontal distance of 24” shall separate outlet boxes on opposite sides of occupancy separation walls, fire-rated walls or partitions.
4. Labeling: Junction box covers shall be marked with indelible ink indicated the circuit numbers passing through the box.

2.4 CONDUIT FITTINGS

A. Requirements: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and plastic conduit bushings of the type and size to suit each respective use and installation.

B. Steel boxes may allow for field knock-out modifications, but shall in all other ways conform to code requirements.

2.5 FLOOR BOXES - SINGLE GANG

A. Construction: Deep cast iron fully adjustable before and after concrete pour with all required components for complete activation. Verify required components for application of service fittings, covers, monuments, and the like, attached to floor boxes.

B. Activations:
1. Flush: Provide brass duplex or single signal cover, hinged with set screw lock. Carpet or tile finish ring.
2. Monuments: Provide stainless steel monuments with power receptacle or data grommet as noted.
3. Coordinate specific application of systems as noted on Drawings.

2.6 FLOOR BOXES - MULTIPLE GANG

A. Construction: Deep cast iron, fully adjustable before and after pour. Equal to Walker/ Wiremold RFB Series or Walker Omnibox multi-service floor box with carpet plates, and/ or water resistant device covers. Verify color. Partition for different power or signal applications. Provide required power receptacle devices and signal grommets or receptacles as noted. Flange type shall be compatible with floor covering for either carpet or vinyl as required and shall be brass type not polycarbonate.

B. Floor mounted boxes shall be water tight and cast iron when installed in grade level

concrete slab floor, fully adjustable with interior and exterior leveling screws. Receptacle flange shall be brass with a duplex lift lid. Flange type shall be compatible with floor type. Before installation, coordinate exact location with Architect.

2.7 PUTTY PADS

A. Intumescent moldable firestop putty designed to protect electrical outlet boxes.

B. Provide putty pads of proper type around outlet boxes and/ or as detailed on plan to meet sound transmission restrictions and fire ratings of walls

2.8 PULLBOXES AND HANDHOLES

A. Construction: High densities precast reinforced concrete box, extension, base, and cover. Furnish box with end and side knockouts and non-settling shoulders. Cover shall have hold-down bolts and two lifting eyes.

B. Size: As indicated on the Drawings.

C. Cover markings: Covers shall read "ELECTRICAL", “COMMUNICATIONS”, or "SIGNAL" as appropriate.

D. Rated covers: Use cast iron lid with H20 traffic rating when subject to vehicular traffic.

PART 3 EXECUTION

3.1 INSTALLATION

A. Conduit systems listed below are for use in installations where they are permitted to be used by CEC and/ or other occupancy restrictions. The below installation methods do not intend to suggest that these materials be installed in conflict with any applicable code. Special attention to applications shall be made in building types such as wet location, hazardous locations, assembly occupancy and multi-story, but not limited to these. Requirements which are more restrictive than the CEC may be called for by the drawings and/ or these specifications. These requirements must be adhered to. The Electrical Contractor shall be responsible to use the proper conduit system for the application. Exposed conduit is not allowed below ceilings or above slab of floor, without prior approval from Electrical Engineer. All conduits shall be concealed except in electrical and telecommunication rooms or where shown to be surface mounted. Exposed conduit (where allowed) shall be run square and plumb with building lines in an approved manner. Support roof mount conduits, where allowed, with minimum 12” wide approved rooftop supports (B-Line Durablok or approved equal) unless otherwise detailed in roof requirements or as specified in roofing specification. Strap conduits to blocks with proper sized conduit straps. Spacing of support shall be a minimum as provided for in the CEC. All exposed conduit mounted below 8’ above finished grade shall be strapped at a minimum of 5’ spacing.

B. Non-Metallic Rigid Conduit shall be used in concrete slabs, below concrete slabs on grade, or underground outside of a building slab or foundation. Maintain minimum depth requirements and cover with appropriate fill material. Conduit shall be heavy wall Schedule 40 or 80, rigid PVC only. Rigid utility P&C duct shall not be used in any application. Properly sized grounding conductors shall be installed per CEC article 250, in all non-metallic conduit branch circuit and feeder runs. PVC conduit shall be formed or field bent only with the use of properly approved bending tools such as to not decrease the internal bore of the conduit. All conduits shall be cut square and reamed of burrs. Approved and compatible glue shall be used on all PVC fittings to attain watertight joints.

C. Galvanized Rigid Steel (GRS) conduit shall be used where exposed less than 8'–0" above finished grade to 18" below finished grade and where subject to physical damage. Conduits shall be cut square and reamed to remove burrs and sharp edges. Strap conduit below 8' above grade at 5' intervals. Unless otherwise noted, threadless setscrew and threadless weathertight fittings may be used in lieu of threaded fittings. All threaded ends entering a junction box of any type shall require one locknut on the inside and one on the outside of the enclosure and be provided with a plastic bushing or grounding bushing where necessary for proper grounding. Where exposed to moisture, a watertight hub or other approved method shall be required. All conduits shall be stubbed up straight and uniform into junction boxes, panels, cabinets, etc., and shall be (GRS) properly supported and strapped. All GRS conduit located below grade, shall be tape wrapped.

D. Electrical Metallic Tubing (EMT) shall be used as allowed by code and as permitted by this specification. It shall not be in contact with soil or the concrete slab on the ground floor of any structure. Connectors and couplings shall be steel insulated set screw type where installed in indoor dry locations not subject to moisture. Where the potential for moisture is present, compression type weathertight fittings are required. One hole conduit straps are permitted from 1/2" to 1" and two hole conduit straps are required for size 1-1/4" and larger. EMT shall not be allowed in areas subject to severe physical damage. Install copper ground wire sized per CEC 250-122 in all EMT conduits.

E. Flexible conduit may be used where concealed in building construction or above dropped ceilings, but shall meet the following criteria: No individual circuit path from distribution panel to last device shall exceed a cumulative length of 6' of flexible conduit from start to end. Flexible conduit shall not exceed a total directional change of 270 bending degrees in any one run between conduit terminations. Squeeze type or Jake type steel flex fittings of a grounding type are required. Flexible conduit must be supported in accordance with CEC. Where exposed to the weather, moisture, or spray down flexible conduit shall be of the liquidtight type. Fittings shall be manufactured for use with liquidtight flexible conduit. All motor connections shall be made with liquidtight flex. Flexible conduit may not be used where exposed except for last 2' of equipment connection and unless otherwise noted or approved. A copper ground wire sized per CEC 250-122 shall be installed in all flexible conduit runs. Flexible conduit may not be used exposed. Weatherproof liquid tight conduit shall not be used at roof level for equipment connections with lengths exceeding 24" nor shall it be used to circumvent a rigid conduit systemin a horizontal direction. Connect recessed lighting fixtures to conduit runs with a maximum of 6' of flexible metal conduit extending from junction box to fixture.

F. Underground conduits and transition to above grade/ slab shall be as follows:
   1. PVC elbows 2" and smaller are allowed, or if top of elbow is minimum 18" BFG or below top of slab, otherwise GRS elbows are required.
   2. GRS risers are required from elbow below grade to equipment (device, outlet, panel, cabinet, etc.) above grade.
   3. GRS elbows/risers to be PVC coated or 10 MIL tape wrapped (1/2" lapped) to 3" above finish grade or top of slab.

G. Conduit Supports: Conduit runs may be supported by one-hole and two-hole straps or supports as manufactured by Unistrut, Minerallac, Caddy or equals. Supports may be fastened by means of anchors, shields, beam clamps, toggle bolts, or other approved methods appropriate for the application and size of conduit. Pipe nailers (J-hooks) may only be used for 1" conduit and smaller and only in wood frame construction. Conduit support methods are subject to review by the engineer and authority having jurisdiction for adequacy. Installations deemed inadequate shall be corrected by the contractor at no cost to the Owner.

H. Bends and offsets shall be made with approved tools for the type of conduit being utilized.

Bends shall be made without kinking or destroying the smooth bore of the conduit. Parallel conduits shall be run straight and true with bends uniform and symmetrical. Minimum radii shall be per CEC 344-24.

I. Conduit Stub-outs below grade shall be capped with plastic cap, and identified by placing a pull box marked with correctly identified utility such as “Elec”, “Tel”, etc. Dimension for exact location on field record drawings. Provide lids for proper field application (i.e. traffic, incidental, pedestrian).

J. Conduit Seals - Where below grade conduits enter structure through slab or retaining wall of building or basement, seal the inside of each conduit as follows:
1. Provide damming material around conductors 3” into conduit. Polywater or equal.
2. Fill 3” of conduit with 3M #2123 sealing compound.
3. Wrap conductors where they exit the conduit with 3M #2229 "Scotch Seal" mastic tape. Lap tape to approximate diameter of the raceway and wrap outside of conduit opening with (minimum) one turn.
4. Use conduit sealing bushings type CSB (O-Z/ Gedney) or equal.
5. Empty conduits shall be sealed with standard non-hardening duct seal compound and then capped to prevent entrance of moisture and gases and to meet fire resistance requirements.
6. Provide cable drip loop minimum 12” high.

K. Marker tape: Place marker tape at 12” below finish grade along and above buried conduits. Label tape "CAUTION: ELECTRICAL LINES BELOW" or similar wording.

L. Electrical and communications systems raceways routed underground shall not occupy the same trench as plumbing utilities such as sewer, water, storm drain, gas or other wet or dry gaseous utility system. A minimum of 12” of undisturbed earth is required. Where utilities must cross in closer proximity to each other due to physical constraints, 6” minimum crossing distances are allowed.

M. Conduits, routed below footings, slabs, grade beams, columns, and other structural elements shall be installed in strict compliance with structural details and criteria shown on structural plans. Clearances below structural elements and sleeves through structural elements must be carefully planned to avoid conflict and must be approved by the structural engineer if conflict arises.

N. All conduit or raceways passing through fire rated walls, floors, or ceilings shall be installed with a listed penetration method which protects the opening to the same rating as the assembly and is non hardening.

O. Location: Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring.

P. Anchoring: Secure boxes rigidly to the substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.

Q. Special Application: Provide weatherproof outlets for locations exposed to weather or moisture.

R. Knockout Closures: Provide knockout closures to cap unused knockout holes where blanks have been removed.

S. Mount outlet boxes, unless otherwise required by ADA and CBC, or noted on drawings, the following distances above the finished floor:
1. Receptacles, Telephone, TV & Data outlets. (measured to bottom of outlet box): +15".

2. Outlet above counter (measured to top of outlet box): +46".
3. Control (light) Switches. (measured to top of outlet box): +48".
4. Fire Alarm Manual Pull Stations, T-stats. (measured to top of outlet box): +48".
5. Fire Alarm Visuals: the lower of +80" to bottom of lens, or 6" below ceiling.
6. Other Outlets: As indicated in other sections of specifications or as detailed on drawings.

T. Coordinate all electrical device locations with the architectural floor plan and interior and exterior elevations to prevent mounting devices within elements that they may conflict such as cabinetry, mirrors, planters, etc.

U. Size outlet and junction boxes to minimum wire fill space requirements. Upsize box as required to allow ease of wire installation and device installation.

V. Outlet and junction boxes in fire rated walls shall be gauged and spaced so as not to exceed the maximum penetration allowed by the assembly without compromising the fire rating. If a conflict arises relative to a specific condition, the contractor shall follow the requirements of the fire authority and ask for guidance from the design team. At no time should a larger box be installed prior to resolution of conflict.

END OF SECTION 26 05 33

SECTION 26 05 53 IDENTIFICATION OF ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section Includes:
   1. Nameplates and warning signs where specified herein and as shown on contract documents including the following:
      a. Nameplates and warning signs permanently installed on all electrical equipment and devices including, but not limited to, the following items:
         1) Enclosures for transformers, switchboards, motor control, panels, pullboxes, cabinets, motors, generators, transfer switches.
         2) Enclosures for all separately enclosed devices including, but not limited to, disconnect switches, circuit breakers, contactors, time switches, control stations and relays, fire alarm panels and lighting control panel.
         3) Wall switches not within sight of outlet controlled.
         4) Special systems such as, but not limited to, telephone, fire alarm, warning, and signal systems. Identification shall be at each equipment rack, terminal cabinet, control panel, annunciator and pullbox.
         5) Devices mounted within and part of equipment including circuit breakers, switches, control devices, control transformers, relays, indication devices and instruments.
   2. Conductor and Cable Identification.

B. Related Sections:
   1. Section 26 05 00: Common Work Results for Electrical.
   2. Section 26 05 19: Low-Voltage Electrical Power Conductors and Cables.
   3. Section 26 20 00 Electrical Distribution Equipment.

C. Reference Standards:
   1. California Electrical Code (CEC) based on NFPA 70 (NEC). California Code of Regulations, Title 24, Part 3.
   2. National Fire Protection Agency (NFPA):
      a. 70E Standard for Electrical Safety in the Workplace.
   3. American National Standards Institute (ANSI):
      a. A13.1 Pipe Markers.
      b. Z535 Standards for Safety Signs and Labels.
   4. Underwriters Laboratories, Inc. (UL):
      a. 969 Standard for Marking and Labeling Systems.
   5. Code of Federal Regulations, Title 29, Part 1910:
      a. 144 Safety color code for marking physical hazards.
      b. 145 Specifications for accident prevention signs and tags.

PART 2 PRODUCTS

2.1 EQUIPMENT LABEL DESIGNATIONS

A. Equipment labels indicating equipment designations both emergency and normal.

Designation per drawings or to be supplied with shop drawings approval.

B. Panelboard labels showing panel designation, voltage, phase, and source.

C. Distribution panels, transformers, safety switches, transfer equipment, etc. Labels shall be per ANSI Z535.4 guidelines.

2.2 MATERIALS

A. For Labels: Three layer laminated plastic or micarta with engraved white letters over black background.

B. For Emergency Equipment: Use engraved white letters over red background.

C. For Warning Signs: Minimum 18 gauge steel with red lettering on white porcelain enamel finish.

D. Arc flash labels shall be provided as required by CEC Article 70E.

E. Conductor tape number markers: TayMac MX4280 Series non-fading permanent adhesive.

PART 3 EXECUTION

3.1 MOUNTING

A. Equipment labels shall be mounted by self-tapping, threaded screws, and bolts, or by rivets. Adhesive types are not acceptable unless specifically noted in this section.

B. Conductor tape markers shall be consistently placed for ready conductor identification.

3.2 HEIGHTS ON LABELS

A. Panelboards, Switchboards and Motor Control Centers and Special Systems Enclosures: 1/4" identify equipment designation; 1/8” identify voltage rating and source.

B. Individual Circuit Breakers, Switches, and Motor Starters in Panelboards, Switchboards, and Motor Control Centers: 3/16” identify circuit and load served, including location of equipment.

C. Enclosed Circuit Breakers, Enclosed Switches, and Motor Starters: 3/16” identify load served.

D. Transformers: 3/16” identify equipment designation; 1/8” identify primary and secondary voltages, primary source, and secondary load. Include location of primary source or secondary load if remote from transformer.

3.3 WARNING SIGNS

A. Warning signs shall be permanently mounted with cadmium plated steel screws or nickel-plated brass bolts.

B. Warning signs to read "DANGER - HIGH VOLTAGE", with letters 1-1/2" high, 3/16” stroke minimum.

C. Provide warning sign on all doors or immediately next to door for equipment rooms, enclosures or closets containing equipment energized above 150 volts to ground as per CEC, and/ or as directed by the Architect. For interior finish spaces and interior doors, signage shall be coordinated and approved with the Architect in advance of installation.

END OF SECTION 26 05 53

SECTION 26 20 00 ELECTRICAL DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Conditions of the Contract Documents and Division 01 - General Requirements as applicable, apply to this Section.

1.2 SUMMARY

A. Provide all electrical distribution and motor control equipment and accessories required to distribute electrical power to all motors, outlets and systems requiring power.

1.3 QUALITY ASSURANCE

A. New: Provide all new equipment.

B. Single Manufacturer: All equipment of each type shall be the product of one manufacturer.

C. UL: Equipment shall be UL listed. Service entrance equipment shall bear UL Service Entrance label.

D. CEC: Equipment and installation shall comply with the California Electrical Code.

E. Wet Locations: Equipment and enclosures installed outdoors and in wet locations shall be approved for this purpose.

F. IEEE: Institute of Electrical and Electronics Engineers Standard 1015-1997 (Blue Book) Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.

1.4 LABELING

A. Nameplates and labeling shall be provided in accordance with Section 26 05 53. All feeders shall be labeled on the feeder device.

1.5 FINISHES

A. All equipment shall have a factory applied gray finish applied over a rust inhibiting treatment. Any items which have the finish marred shall be touched up or refinished to a new condition before final acceptance. This shall include, but shall not be limited to, sanding and properly removing rust or other contaminants and completely repainting equipment if damage is extensive. Overall acceptance is subject to approval of the Engineer.

1.6 SUBMITTALS

A. Provide complete product data for each equipment type. Provide electric service studies when required.

B. Submittal shall include written recommendation from manufacturer of settings for all electronic trip adjustment setting on all equipment furnished with adjustable trip settings. Contractor is responsible for adjusting all electronic trip settings per manufacturer recommendations.

C. Electrical connections to all equipment furnished by any other division shall be coordinated with final approved equipment submittals from other divisions including but not limited to circuit breaker sizes, conduit sizes, wire sizes, fuse sizes, disconnect switch sizes and starter sizes that differ from those shown on the drawings prior to submitting Electrical Distribution Equipment submittal.

1.7 SHORT CIRCUIT CURRENT RATINGS

A. General: All switchboards and panelboards shall be fully rated and marked with a maximum short circuit current rating. The equipment manufacturer shall have verified this rating with high-amperage testing. All short circuit current ratings are expressed as amperes RMS symmetrical at the applied voltage unless otherwise noted. All equipment shall withstand the specified level of fault current. All overcurrent devices shall interrupt the specified level of fault current.

1.8 ELECTRIC SERVICE STUDIES

A. Standard: Submit studies in accordance with ANSI/ IEEE Standard 242 Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.

B. Submit one-line diagram for each electrical service. Key all equipment and components on diagram to items in the studies.

C. Provide a short-circuit current analysis for each main switchboard. Short-circuit analysis shall calculate short-circuit levels at service transformer secondary, switchboard main breaker, each feeder breaker and all levels of downstream distribution equipment. Assume infinite source bus.

D. Provide a time-current coordination study for each main switchboard. Coordination study shall compare the operating levels and times of the protective devices to the withstand levels and times that the equipment can sustain without damage or failure. Determine electronic trip unit settings necessary to achieve optimal selective coordination between 480 volt main service circuit breakers and first level of feeder distribution devices. Determine setting for all adjustments of trip units of all electronic circuit breakers that are linked by zone-selective-interlocking. Furnish time-current curves for the two (or more) levels of distribution protected with electronic trips, plus the first additional distribution level served from the switchboard feeder. Show a separate composite plot for each feeder breaker trip rating with the main breaker. Plot composite time-current curves on log-log background. Add a typical frame size of downstream molded-case circuit breaker to each switchboard feeder composite plot.

E. Provide arc-flash calculation and labeling for equipment in the project.

F. The contractor shall make all adjustments to circuit breakers per electric service study and provide written documentation that all adjustments have been made.

1.9 OWNER'S INSTRUCTION

A. Provide a four-hour period of instruction to the Owner's designated personnel upon completion of the main switchboard’s installation. Review manufacturer’s recommended switchboard maintenance. The Operations and Maintenance Manual shall be complete and on-site at the time of Owner instruction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Unless indicated otherwise, all equipment in this section shall be provided by a single manufacturer. The product designations listed are to establish a level of quality. Acceptable manufacturers are:
   1. Square D.
   2. Siemens.
   3. G.E.
   4. Cutler-Hammer.

2.2 ENCLOSED SWITCHES

A. General: Provide heavy duty enclosed switches similar to Square D Class 3100 Type HD.

B. Switch Interior:
   1. All switches shall have switchblades which are visible when the switch is OFF and the cover is open.
   2. Lugs shall be front removable and UL Listed for 75 degrees Celsius conductors.
   3. All current carrying parts shall be plated to resist corrosion.
   4. Switches shall have removable arc suppressors to facilitate easy access to line side lugs.
   5. Switches shall have provisions for a field installable electrical interlock.

C. Switch Mechanism:
   1. Switch operating mechanism shall be quick-make, quick-break such that, during normal operation of the switch, the operation of the contacts shall not be capable of being restrained by the operating handle after the closing or opening action of the contacts has started.
   2. The operating handle shall be an integral part of the box, not the cover.
   3. Provisions for padlocking the switch in the OFF position with at least three padlocks shall be provided.
   4. The handle position shall travel at least 90 degrees between OFF and ON positions to clearly distinguish and indicate handle position.
   5. All switches shall have a dual cover interlock mechanism to prevent unintentional opening of the switch cover when the switch is ON and prevent turning the switch ON when the cover is open. The cover interlock mechanism shall have an externally operated override, but the override shall not permanently disable the interlock mechanism. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

D. Switch Enclosures:
   1. Switch covers shall be attached with welded pin-type hinges.
   2. The enclosure shall be finished with gray baked enamel paint, which is electrodeposited on cleaned, phosphate pre-treated steel.
   3. The enclosure shall have ON and OFF markings stamped onto the cover.
   4. The operating handle shall be provided with a dual colored, red/ black position indication,
   5. All switches shall have provisions to accept up to three (3) 3/8-inch hasp padlocks to lock the operating handle in the OFF position.
   6. Tangential knockouts shall be provided to facilitate ease of conduit entry.

E. Switch Ratings:
   1. Switches shall be horsepower rated for ac and/ or dc as indicated on the plans.
   2. The UL Listed short circuit current rating of the switches shall be 200,000 rms symmetrical amperes when used with or protected by Class J fuses.
   3. Non-Fusible: 10,000 rms symmetrical amps.

F. Fuse Clips: NEMA FU 1, Class J fuses.

2.3 SINGLE CIRCUIT BREAKERS WITH ENCLOSURES

A. Product Description: Enclosed, molded-case circuit breaker conforming to NEMA AB 1, suitable for use as service entrance equipment where applied.

B. Circuit Breakers: Molded case, quick make, quick break, trip free, common thermal magnetic trip.

C. Ratings: Continuous current, poles as required, 480 volt system breaker shall interrupt short circuits up to 14,000 rms amps symmetrical; on 120/ 208 - 240 volt system, 10,000 amp rms symmetrical.

D. Enclosure: NEMA AB 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
   1. Interior Dry Locations: Type 1.
   2. Exterior Locations: Type 3R.

E. Nameplate: Provide a nameplate showing load served.

2.4 FRACTIONAL HORSEPOWER MANUAL MOTOR CONTROLLER

A. Square D - Class 2510 Type F:
   1. Description: NEMA ICS 2, ac general-purpose Class A manually operated, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, red pilot light and toggle operator.
   2. Enclosures: ANSI/ NEMA ICS 6, Type as indicated.

2.5 MAGNETIC MOTOR CONTROLLERS

A. Square D - Class 8536 Type S:
   1. Description: NEMA ICS 2, ac general-purpose Class A magnetic controller for induction motors rated in horsepower.
   2. Coil Operating Voltage: Provide as required to interface with controls system, including control power transformer.
   3. Coil: Be of encapsulated type.
   4. Poles: as indicated.
   5. Size: as indicated.
   6. Contacts: Totally enclosed, double-break, silver-cadmium-oxide power contacts. Contact inspection and replacement shall be possible without disturbing line or load wiring.
   7. Wiring: Straight-through wiring with all terminals clearly marked.
   8. Overload Relay: NEMA ICS:
      a. Solid State: Trip current rating will be established by selection of overload relay and shall be adjustable (3 to 1 current range). The overload shall be self-powered. Provide phase loss, phase unbalance protection, permanent tamper guard, Trip Class 10 or 20 and a mechanical test function.
      b. Outputs: Units shall be designed for addition of either a normally open or normally closed auxiliary contact and shall be field convertible. Provide one (1) set of N.O. and N.C. contacts in each starter.
      c. Reset: Unit shall include both manual reset and remote reset using an external module.
      d. Select overload current setting based on the motor nameplate data of the actual motor to be protected. All standard NEMA sizes may be used for the overload relay, including Size 00.
   9. Enclosure: ANSI/ NEMA ICS 6, Type 1, 3R or 4X.

10. Control Power Transformers: 120 volt secondary. VA minimum, in each motor starter. Provide fused primary and secondary.
11. Provide red LED running pilot light and H-O-A switch.

2.6 MAGNETIC MOTOR CONTROLLERS - TWO - SPEED

A. Square D - Class 8810 Type S:
1. Description: Include integral time delay transition between FAST and SLOW speeds. Starters shall be electrically and mechanically interlocked to prohibit both starters being energized simultaneously.
2. Coil operating voltage: Provide as required to interface with controls system, including control power transformer.
3. Coil: Be of encapsulated type.
4. Poles: as indicated.
5. Size: as indicated.
6. Contacts: Totally enclosed, double-break, silver-cadmium-oxide power contacts.
7. Contact inspection and replacement shall be possible without disturbing line or load wiring.
8. Wiring: Straight-through wiring with all terminals clearly marked.
9. Overload Relay: NEMA ICS.
   a. Solid State: Trip current rating will be established by selection of overload relay and shall be adjustable (3 to 1 current range). The overload shall be self-powered. Provide phase loss, phase unbalance protection, permanent tamper guard, Trip Class 10 or 20 and a mechanical test function.
   b. Outputs: Units shall be designed for addition of either a normally open or normally closed auxiliary contact and shall be field convertible. Provide one (1) set of N.O. and N.C. contacts in each starter.
   c. Reset: Unit shall include both manual reset and remote reset using an external module.
   d. Select overload current setting based on the motor nameplate data of the actual motor to be protected. All standard NEMA sizes may be used for the overload relay, including Size 00.
10. Enclosure: ANSI/ NEMA ICS 6, Type 1, 3R or 4X.
11. Two speed motor controllers shall be designed for type of motor winding specified in Division 23 Mechanical Specifications, Drawings, or Equipment Schedule. Coordinate with Division 23 prior to submittal.
12. Provide red-high, amber-low running pilot lights and H-O-L-A switch.
13. Provide two speed motor controllers for all two speed motors specified in Division 23 Mechanical Specifications, Drawings, or Equipment Schedule. Coordinate with Division 23 prior to submittal.

2.7 COMBINATION DISCONNECT/ MOTOR STARTERS

A. Square D - Class 8538 Type S (Fusible or no fuse, as shown on plans):
1. Description: Combine magnetic motor controllers with fusible switch disconnect in common enclosure. The switch shall have a color coded externally operated handle. Operating handle shall give positive visual indication of ON/ OFF with red and black color-coding.
2. Fusible Switch Assemblies: NEMA KS 1, enclosed knife switch with externally operable handle. Fuse clips: Designed to accommodate Class J fuses and visible blades. Operating handle shall give positive visual indication of ON/ OFF with color-coded operating handle.
3. Magnetic Motor Controllers: Refer to paragraph(s) specifying magnetic motor controllers for requirements.

2.8 FUSES (600 VOLTS AND BELOW)

A. Manufacturers:
   1. Bussmann.
   2. Little Fuse.
   3. Ferraz Shawmut.

B. Dimensions and Performance: NEMA FU 1, Class as specified or as indicated on Drawings.

C. Voltage: Rating suitable for circuit phase-to-phase voltage.

D. Class J (Time Delay) Fuses:
   1. Dimensions and Performance: NEMA FU 1.
   2. Voltage: Rating suitable for circuit phase-to-phase voltage.
   3. Dual-element, time delay ten (10) seconds (minimum) at 500 percent rated current.

E. Spares: Spare fuses shall be provided in the amount of ten (10) percent of each type and size installed. Replacement for fuses and limiters blown during construction shall not count as spares.

2.9 DISTRIBUTION PANELBOARDS

A. Product Description: NEMA PB 1, circuit breaker type panelboard.

B. Panelboard Bus: copper current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.

C. Continuous current rating shall be sufficient to protect wiring and equipment served:
   1. Panels 400A and smaller, 35,000 amperes rms symmetrical.
   2. Panels greater than 400A: 65,000 amperes rms symmetrical.

D. Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Furnish circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

E. Main Circuit Breaker:
   1. When distribution panel has main circuit breaker, provide molded case circuit breaker with electronic trip unit. Current sensing to be true-rms.
   2. Main breaker shall have minimum interrupting rating of 65,000 amperes rms symmetrical at applied voltage.
   3. Electronic trip shall be Square D micrologic with adjustable long-time, short-time and instantaneous pick-up set points.

F. Cabinet Front: Safety dead front type. Conform to NEMA 1; NEMA 3R if located outdoors. All panelboards located in kitchen areas shall be flush mount with NEMA 4X Stainless Steel enclosures.

2.10 BRANCH CIRCUIT PANELBOARDS

A. Product Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

B. Panelboard Bus: Copper current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.

C. For non-linear load applications subject to harmonics furnish 173 percent rated, plated copper, solid neutral.

D. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 208-240/ 120 volt panelboards; 22,000 amperes rms symmetrical for 480 volt panelboards.

E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.

F. Enclosure: NEMA PB 1, Type 1 or Type 3R. All panelboards located in kitchen areas shall be flush mount with NEMA 4X Stainless Steel enclosures.

G. Cabinet Front: Safety dead front type with concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finish in manufacturer's standard gray enamel.

H. Provide ground-fault circuit breaker for each heat trace branch circuit.

I. Panelboards indicated to have thru-feed lugs shall be furnished with thru-feed lugs in all sections of panelboard.

PART 3 - EXECUTION

3.1 MOUNTING

A. General: All equipment shall be securely fastened in place.

B. Locations: In all cases mounting locations shall comply with the requirements of the California Electrical Code. This shall include providing suitable working clearances.

C. Concrete Pads:
1. Provide concrete in accordance with the Division of the Specifications for that product.
2. Indoor concrete pads shall consist of a four (4) inch pad with beveled edges extending two (2) inches beyond the perimeter of supported equipment. Switchboards shall be installed on a pad. Refer to the drawings and the specifications for each piece of equipment to determine what other equipment shall be mounted on a pad.
3. All equipment, ground mounted outdoors, shall be mounted on a pad. Outdoor pads shall be minimum of one foot thick reinforced with #4 rebar one (1) foot on center each way. Size outdoor pads with at least four (4) feet working clearance in front of equipment and one (1) foot on all sides. Provide anchor bolts for pad-mounted equipment. Refer to Detail on drawings.

A. Wall Mounted Equipment: Wall mounted equipment shall be suitably positioned on the wall. Equipment mounted on the exterior basement wall shall have unistrut channels between the wall and the equipment to prevent condensation problems. Where wall mounted equipment is specified, but a convenient wall not available, a suitable unistrut mounting stanchion anchored in concrete shall be provided. In lieu of this stanchion, small devices may be mounted on to the equipment served if approved by the equipment manufacturer.

B. Motor rated disconnects: Install disconnects in a vertical orientation with off in the down position.

3.2 DELIVERY, STORAGE AND HANDLING

A. General:

1. Store all types of electrical power distribution equipment in a clean, heated building affording appropriate physical protection. Control access to prevent unauthorized tampering with the equipment. However, equipment may be stored in other inside or outside environments under approved conditions.
2. Inspect equipment when received at Project site for shipping damage. Report as required by freight carrier to recover repair or replacement costs from the freight carrier in the event damage was sustained.
3. Covers are required unless indoor, ventilated storage conditions exist. Canvas tarpaulins or the equivalent are preferred over other coverings because they provide better humidity control and enclosure scuff protection. Where exposed to moisture, covers shall be waterproof.
4. The manufacturer's shipping skids shall be left on the equipment to provide structural support until the equipment is set in the final resting place.
5. Refer to Section 26 05 00 for additional requirements. Contractor shall furnish new equipment to replace any equipment that is exposed to weather or subjected to other deleterious effects of construction.

B. Approved Conditions for Equipment Storage:
1. General: Where storage conditions specified above are not available, indoor or outdoor storage shall comply with the following.
2. Switchboards, Motor Control and Other General Distribution and Utilization Equipment:
   a. Store metal-enclosed equipment in an upright position. Provide good ventilation of the shelter and protection from dirt, moisture and physical damage.
   b. Space heaters furnished with the equipment shall be connected to a continuous source of power of the proper rating. Where space heaters are supplied from auxiliary power transformers, care shall be taken that low-voltage heater circuits are properly isolated before power source connection to prevent inadvertent energizing of the auxiliary transformer and associated high-voltage primary wiring.
   c. Ambient conditions may allow condensation inside waterproof covers. If condensation is occurring, temporary heaters or lamp banks shall be provided of sufficient wattage to prevent condensation.
   d. Contractor shall ensure that equipment stored in shipping cases receives adequate ventilation to avoid mildew and prevent condensation.

3.3 GROUND FAULT PROTECTION OF EQUIPMENT

A. General: Provide for system performance testing as required by the California Electrical Code. Provide each ground fault relay, sensing device or ground fault protection system with instructions and a test form. The form shall be retained by those in charge of the building's electrical installation and be available to the authority having jurisdiction. The instruction content shall be as required by UL.

3.4 LABELING

A. Nametag: Provide a nametag for each piece of distribution equipment; see Section 26 05 53, Electrical Identification.

END OF SECTION 26 20 00

SECTION 26 27 26 WIRING DEVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section Includes:
   1. Wiring devices.

B. Related Sections:
   1. Section 26 05 00: Common Work Results for Electrical.
   2. Section 26 05 19: Low-Voltage Electrical Power Conductors and Cables.
   3. Section 26 05 26: Grounding and Bonding for Electrical Systems.
   4. Section 26 05 33: Raceway and Boxes for Electrical Systems.

C. Reference Standards:
   1. California Electrical Code (CEC) based on NFPA 70 (NEC). California Code of Regulations, Title 24, Part 3.
   2. National Electrical Manufacturers Association (NEMA):
      a. WD 1 General Color Requirements for Wiring Devices.
      b. WD 6 Wiring Devices - Dimensional Specifications.
   3. National Electrical Manufacturers Association (NECA):
      a. 1 Good Workmanship in Electrical Construction.
   4. National Electrical Testing Association (NETA):
      a. ATS Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
   5. Underwriters Laboratories, Inc. (UL):
      a. 20 Safety General-Use Snap Switches.
      b. 231 Standard for Power Outlets.
      c. 498 Attachment Plugs and Receptacles.
      d. 943 Ground-Fault Circuit-Interrupters.
      e. 1436 Standard for Outlet Circuit Testers and Similar Indicating Devices.
      f. 1472 Solid-State Dimming Controls.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Receptacles, Switches, Wall Plates:
   1. Cooper Wiring Devices; Division of Cooper Industries, Inc.
   2. Hubbell Incorporated; Wiring Device-Kellems.
   3. Leviton Mfg. Company, Inc.
   4. Pass & Seymour/ Legrand.

2.2 RECEPTACLES

A. General for all receptacles:
   1. Device shall be listed by UL

2. Mounting straps shall be plated steel, with break-off plaster ears and shall include a self- grounding feature (this feature does not substitute for a grounding conductor terminated on grounding strap of device). Terminal screws shall be brass, brass plated or a copper alloy metal.
3. Receptacles shall be of a screw terminal type, “pressure type quick wire” terminations are not allowed.

B. Duplex receptacles shall be premium specification grade single phase, 20 ampere, 120 volts, 2-pole, 3-wire, and conform to the NEMA 5-20R configuration in NEMA WD 6. The duplex type shall have bussing break-off feature for two-circuit operation. The ungrounded pole of each receptacle shall be provided with a separate terminal:
1. Wiring device color shall be standard white. Contractor to verify device color with Architect prior to procurement.
2. Ground Fault Interrupter Duplex Receptacles - Shall be an integral unit suitable for mounting in a standard outlet box:
   a. Ground fault interrupter shall be commercial grade and consist of a differential current transformer, solid state sensing circuitry and a circuit interrupter switch. It shall be rated for operation on a 60 Hz, 120 volt, 20-ampere branch circuit. Device shall meet CEC requirements. Device shall have a minimum nominal tripping time of 1/30th of a second. Devices shall meet UL 943.

C. Receptacles; 20, 30 and 50 ampere, 250 volts: Shall be complete and match with appropriate cord grip plug. Devices shall meet UL 231.

D. Weatherproof Receptacles: Shall consist of a listed weather resistant duplex receptacle, mounted in box with a gasketed, while in use weatherproof, cast metal cover plate and cap receptacle opening. The cap shall be permanently attached to the cover plate by a spring-hinged flap.

2.3 SWITCHES

A. Toggle switches shall be totally enclosed tumbler type with bodies of phenolic compound. Toggle handles color to match receptacle device color unless otherwise specified:
1. Shall be single unit toggle, butt contact, quiet AC type, heavy-duty general-purpose use with an integral self-grounding mounting strap with break-off plasters ears and be of a screw terminal type.
2. Shall be color coded for current rating, listed by UL, and meet the requirements of NEMA WD 1, Heavy-Duty and UL 20.
3. Ratings:
   a. 120 volt circuits: 20 amperes at 120-277 volts AC.
   b. 277 volt circuits: 20 amperes at 277 volts AC.
4. The switches shall be mounted on the strike plate side of doors.
5. Incorporate barriers between switches with multi-gang outlet boxes where required by the CEC.
6. All toggle switches shall be of the same manufacturer.

2.4 WALL PLATES

A. Wall plates for switches and receptacles shall be type 302 stainless steel.

B. Standard NEMA design, so that products of different manufacturers will be interchangeable. Dimensions for openings in wall plates shall be accordance with NEMA WD1.

C. For receptacles or switches ganged together, wall plates shall be a single ganged plate.

D. Wall plates for data, telephone or other communication outlets shall be as specified in the associated specification.

E. Surface mounted boxes, NEMA1, shall be industrial grade raised galvanized steel covers. In shop areas, all receptacles shall be dust proof and or waterproof where applicable.

F. Waterproof device covers shall be cast iron, 4-corner screw type, for FS and FD type mounting. Device covers shall be zinc galvanized finish. Weatherproof covers shall be lockable.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation shall be in accordance with the CEC, NECA “Standard of Installation”, and as shown as on the drawings.

B. Ground terminal of each receptacle shall be bonded to the outlet box with an approved green bonding jumper, and also be connected to the green equipment grounding conductor.

C. General: Devices shall be of the type specified herein. All devices shall be installed with “pigtailed” leads from the outlet box. No device shall be used in the “feed through” application. Screw terminals shall be used to connect all devices to the circuit and shall be grounded by means of a ground wire where grounding terminals are provided in the device.

D. Installation: Devices and plates shall be installed in a “plumb” condition and must be flush with the finish surface of the wall where boxes are recessed.

E. Mounting heights: All control and convenience devices shall comply with California Code of Regulations Title 24, ADA, and CBC with respect to accessibility requirements. Mounting heights indicated on plans shall have precedence.

F. Install switches with the off position down.

G. Clean debris from outlet boxes.

H. Provide extension rings as required to bring outlet boxes flush with finished surface or casework.

I. Test each receptacle device for proper polarity.

END OF SECTION 26 27 26

SECTION 26 31 00 – PHOTOVOLTAIC POWER SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Work included: Labor, materials, and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:
   1. PV Inverter(s).
   2. PV modules or panels.
   3. Rapid Shutdown Devices.
   4. Disconnect switch(es).
   5. Combiner and junction boxes.
   6. Monitoring.
   7. Associated Conduit and Wire,
   8. Utility-required metering/ monitoring equipment.
   9. Start-up and field quality control.

B. Related Work: Consult all other Sections, determine the extent and character of related Work, and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.
   1. Structural work: Module racking and supports. Refer to Division 05 for structural requirements.

1.2 REFERENCES

A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated or specified:
   1. Institute of Electrical and Electronic Engineers (IEEE):
      a. IEEE 587: Category B for Surge Withstand ability (ANSI C62.41).
      b. IEEE 1547: Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces.
   2. California Building Standards Code:
      a. CEC: California Electrical Code, 2022 Edition.
      b. CBC: California Building Code.
      c. CFC: California Fire Code (Section 1204 Solar Photovoltaic Power Systems).
   3. Underwriters Laboratories, Inc. (UL):
      a. UL 1703: Standard for Flat-Plate Photovoltaic Modules and Panels.
      b. UL 1741L: Standard for Inverters, Converters and Controllers for Use in Independent Power Systems.
      c. UL 1741 SB: Advanced Inverter Testing and Certification Program.
      d. UL 2703: Standard for Mounting Systems, Mounting Devices, Clamping/ Retention Devices, and Grounds Lugs for Use with Flat-Plate Photovoltaic Modules and Panels.
      e. UL 61730: Photovoltaic (PV) Module Safety Qualification.

B. California Energy Commission:
   1. Title 24, Part 6, JA11 Standard for system sizing, interconnection, and performance monitoring.
   2. PV Module List.
   3. Grid Support Solar Inverter List.

1.3 DEFINITIONS

A. PV power system: Photovoltaic power source consisting of input and output feeders, PV inverter(s), PV modules or panels, MLPE, DC disconnect(s), combiner and junction boxes, remote monitoring panels, data acquisition systems, and associated accessories.

B. Module Level Power Electronics (MLPE): Devices that can be incorporated into a solar PV system, at the module level, to improve performance or provide additional system safety. MLPE's include power optimizers, module level inverters, module level monitoring and/ or rapid shutdown.

1.4 SUBMITTALS

A. Provide complete product data for each equipment type.
   1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
   2. Describe system operation, equipment and indicate features of each component.
   3. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
   4. Shop Drawings to include:
      a. Completely dimensioned plan view (1/4-inch scale) of all PV modules and associated equipment located in, on and around the building. Clearly indicate conduit pathways and clearance requirements
      b. One line power diagram: Complete interconnection schematic wiring diagrams indicating all major power components, including the current draw on each feeder and wiring requirements and conductor terminal identification for the following items:
         1) PV inverter(s).
         2) Disconnect switch(es).
         3) AC Panelboards/ Switchboards.
         4) Rapid Shutdown Devices.
         5) PV modules.
         6) Combiner and junction boxes.
         7) Conduit and wire specifications.
         8) Overcurrent protection device ratings.
         9) Utility-required metering/ monitoring equipment.
         10) Data acquisition system(s).
      c. Grounding diagram: Complete interconnection schematic wiring diagram showing all major ground connections and wiring requirements for the following:
         1) Modules.
         2) Racking equipment.
         3) PV mounting structures.
         4) PV inverter(s).
         5) Disconnect Switches.
         6) AC Panelboards/ Switchboards.
         7) Equipment grounding and bonding.
         8) Grounding electrode system.
         9) Equipment bonding jumpers.
   5. Furnish structural calculations for equipment and mounting structure. Provide weights, dimensions, and center of gravity for structural calculations.
   6. Furnish structural engineering drawings and calculations for PV module racking, attachment, and anchorage to building or structure. Structural drawings and calculations shall be stamped by a licensed structural engineer. Structures requiring calculations shall include, but is not limited to:
      a. Carports and canopies.
      b. Rooftop racking equipment.

c. Ground mounted PV arrays.
7. Submit Manufacturer's installation instructions.
8. Complete Bill of Materials listing all components; include equipment height, width, depth, and weight.
9. Warranty.

B. Electrical connections to all equipment furnished by any other division shall be coordinated with final approved equipment submittals from other divisions including but not limited to circuit breaker sizes, conduit sizes, wire sizes, fuse sizes, disconnect switch sizes and starter sizes that differ from those shown on the drawings prior to submitting Photovoltaic Power System submittal.

C. Dimensions and configurations of PV components shall conform to the space allocated on the Drawings. The Contractor shall submit a revised layout if the equipment furnished varies in size from that indicated on Drawings for Engineer's approval.

D. Installer's qualifications: Furnish satisfactory proof of required experience specified herein for system installer.

E. Copies of the completed and submitted rebate and incentive program documents.

1.5 OPERATION AND MAINTENANCE MANUAL

A. Supply operation and maintenance manuals to include the following:
1. A detailed explanation of the operation of the system.
2. Instructions for routine maintenance.
3. Pictorial parts list and part numbers.
4. Schematic wiring diagrams.
5. Telephone numbers for the authorized parts and service distributor.
6. Include all service bulletins.
7. Final testing reports.

1.6 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.

B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

C. Manufacturer qualifications: Firms regularly engaged in the manufacturing of PV power systems of types and sizes required for this Project and whose products have been in satisfactory use in similar service for not less than 5-years.

D. Inverter manufacturer shall have produced no less than 250MW of inverters in the prior two years.

E. Panel or module manufacturer shall have produced no less than 250MW of inverters in the prior two years.

F. Installer's qualifications: Firms with a minimum of 5-years of successful installation experience with Projects utilizing PV power systems similar to that of this Project.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Shipment: The equipment specified herein shall be delivered complete and ready for installation, to the Owner's Project site. The Contractor shall not order equipment without written approval by the Engineer.

B. Delivery: PV power system components shall not be delivered to the Project site until Contractor is ready for installation and construction is complete in area. Equipment damaged during shipping shall be replaced and returned to Manufacturer at no cost to Owner.

C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

1.8 UTILITY INTERCONNECTION REQUIREMENTS

A. The PV power system provider shall be responsible for acquiring the utility interconnection approval permit. This includes acquiring all forms, documents, permit applications, associated fees and attending any required meetings with the utility.

B. The PV power system provider shall comply with all utility interconnection requirements. The Contractor shall be responsible for all interconnection coordination during construction including utility company coordination, revisions to interconnect applications as-needed, inspections, permits, and final approval for the complete interconnection of the PV systems with the utility company grid, including the bi-directional utility meters.

C. The Engineer shall be copied on all forms, documents, applications, permits and correspondence between the PV power system provider and utility.

1.9 REBATE AND INCENTIVE PROGRAMS

A. The PV power system provider shall be responsible for acquiring, completing, and submitting information to qualify and reserve funds from rebate and incentive programs offered by state and federal programs in the Owner’s name.

B. The PV power system provider shall coordinate all inspections and perform all follow-up Work deemed necessary in order for the Owner to receive the rebate or incentive compensation.

C. The Engineer shall be copied on all forms, documents, applications, permits and associated correspondence.

1.10 WARRANTY

A. Workmanship, parts and labor:
   1. Contractor shall provide a 1-year warranty on workmanship covering parts and labor for units and components offered under this Section. Warranty shall begin upon acceptance by the Owner.
   2. The contractor shall promptly correct any deficiencies in the materials and workmanship, which occur during the parts and labor warrantee to the satisfaction of the Engineer at no additional cost to the Owner.

B. Solar PV panels and modules, and MLPE equipment:
   1. Module manufacturer shall provide a 25-year product and power output warranty on

the solar modules, including factory integrated electronics. PV Module(s) shall be free from defects in materials and workmanship under normal application, installation, use and service conditions, and the power of the PV Modules will be at least 98% of the Minimum Peak Power rating for the first year, and will decline by no more than 0.5% per year for the following 24 years, so the power output at the end of the final year of the 25th year warranty period will be at least 92% of the Minimum Peak Power rating (the “Guaranteed Peak Power” rating).

2. Manufacturer of MLPE devices (power optimizers, rapid shutdown devices, etc.) shall provide a minimum 25-year product warranty.

C. Solar PV Inverters:
   1. Inverter manufacturer shall provide a minimum 10-year warranty.

D. Warranty discharge limitations shall be specified and shall be consistent with these Specifications.

1.11 MAINTENANCE

A. Maintenance services:
   1. For a period of 1 year following acceptance the equipment Supplier shall have a person(s) familiar with this Project attend 2 meetings with the Owner's Representative to review system performance, operation, and any system problems. That person shall provide a written summary of the items discussed in each meeting and a schedule of when the system problems will be corrected. The report is due within 7 working days after each meeting.
   2. Provide a 2-year Manufacturer's maintenance contract of the full PV power system. The 2-year period shall begin from the date of acceptance on a total no-charge basis. During this period, Manufacturer's maintenance staff shall visit the installation not less than 2-times for routine inspection and preventive maintenance. The maintenance visits shall be scheduled at 6-month intervals and shall be coordinated with the Owner and performed at times selected by the Owner. A written report of each maintenance visit shall be submitted to the Owner within 10-days. The vendor shall submit a preventative maintenance schedule outlining in detail the following:
      a. Time and duration when services are to be performed.
      b. Work to be performed. Minimum Work per visit shall include voltage and current readings on all PV modules or panels.
      c. Shutdowns required for service.
      d. Company or Contractor support services required.
   3. Manufacturer of PV power system shall have service and maintenance personnel solely in employ of and trained by Manufacturer in the maintenance, field testing, repair, and adjustment of the type of system to be provided.
      a. Service and maintenance personnel to be used for on-site testing and placing system in operation to have minimum of 2-years of experience with system to be provided.
      b. Service and maintenance personnel shall be capable of responding to requests for emergency on-site service calls within 24 hours from initial call during normal working hours (8 a.m. to 5 p.m. Monday, through Friday) and within 48 hours during off hours (holidays, weekends, evenings after 5 p.m.).

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated in the Drawings.

1. PV inverters: Refer to the basis of design included in the drawings.
2. PV modules or panels: Refer to the basis of design included in the drawings.

B. Substitutions:
1. PV inverters: Refer to the latest California Energy Commission List for Approved Grid Support Inverters.
2. PV modules or panels: Refer to the latest California Energy Commission List for PV Modules

2.2 GENERAL

A. The PV power system shall consist of the following:
1. PV inverter(s).
2. Utility interconnection protection.
3. Rapid Shutdown Devices.
4. System metering, system status indicators and system alarm annunciation circuitry.
5. PV modules or panels.
6. Accessories as specified herein.

B. Installation and wiring methods shall conform to the requirements set forth in the CEC Articles 690 and 705.

C. Logic and control connections shall be routed away from any power runs.

2.3 RATINGS

A. The PV system kW rating (in AC and DC STC) shall be as indicated on the Drawings. Each PV system shall consist of the quantity of PV inverters and PV modules as indicated on the Drawings.

2.4 PV INVERTER CHARACTERISTICS

A. The PV inverter shall be UL 1741-SA Listed.

B. The PV inverter shall be listed on the latest California Energy Commission List for Approved Grid Support Inverters.

C. DC Input:
1. Surge withstand rating: Per IEEE 587/ ANSI C62.41, category B standards.
2. Integrated DC disconnect, 650 VDC (minimum) load-break rated.
3. Ground Fault protection (detection and isolation) in accordance with CEC Article 690.41(B).
4. Listed arc fault circuit interrupter in accordance with CEC Article 690.11.

D. AC Output:
1. Rating: Refer to drawings.
2. Frequency: 60 Hz., plus or minus 0.5 Hz.
3. Minimum Efficiency: 96%.
4. Capable of producing reactive power to operate between a power factor of 0.9 lagging to 0.9 leading (as adjusted on the inverter equipment).
5. Surge withstand rating: Per IEEE 587/ ANSI C62.41, Category B Standards.

E. Noise level: Noise generated by the PV inverter(s) under any condition of normal operation shall not exceed the allowable sound pressure level of 75dBa (75/ 150 CPS octave band) measured at five feet from the nearest surface of the cabinet using a sound level measuring

device equivalent to a General Radio type 1551B. If noise generated by the PV inverter(s) exceeds this value, the Manufacturer shall install, at his own expense, additional acoustical treatment on the walls and ceiling of the PV inverter equipment room to reduce the noise level to acceptable values.

F. Environmental conditions: The PV inverter shall be capable of withstanding any combination of the following external environmental conditions without mechanical or electrical damage or degradation of operating characteristics.
   1. Operating ambient temperature: 0-degrees C to 40-degrees C.
   2. Non-operating and storage ambient temperature: -10-degrees C to 40-degrees C.
   3. Relative humidity: 5% to 95% non-condensing for all temperatures in the temperature range stated above.
   4. Altitude to 4000-feet above means sea level without derating.

2.5 CONTROLS

A. The following system level control functions shall be provided:
   1. Start/ Stop switch to enable or disable the PV inverter. Located on the front panel.
   2. Maximum power tracking circuitry to achieve maximum power output.
   3. Automatic start-up when sufficient DC voltage is present for a specified time.
   4. Automatic turn-off when insufficient DC voltage is present for a specified time.
   5. Lamp test/ reset pushbutton.
   6. Audible alarm test/ reset pushbutton.
   7. Audible alarm silence button.

2.6 RAPID SHUTDOWN DEVICES

A. General:
   1. Module level device capable of reducing shock hazard for emergency responders. Device shall be listed for providing rapid shutdown protection and meet the requirements of CEC Article 690.12.

2.7 PV MODULES OR PANELS

A. General:
   1. PV modules shall be UL 1703/ UL 61730 Listed.
   2. Each module shall have bypass diodes for shadow tolerance.
   3. Each module shall be effectively bonded to the racking structure via UL 2703 listed racking assembly or UL 2703 listed bonding devices.
   4. Fire performance Type as listed per UL 1703/ UL 61730. Module shall achieve a fire resistance Class B rating when paired with a PV racking system.
   5. PV modules shall withstand winds up to 140mph without damage to the modules or roofing structure.
   6. PV modules shall be connected in series to form strings, and the quantity of modules per string shall be selected to ensure that the maximum string voltage never exceeds 650 volts DC under any conditions.

B. PV Modules:
   1. Installation method shall be per manufacturer’s instructions or approved methods.
   2. The PV module shall have a minimum efficiency rating of at least 16.5%.

2.8 DISCONNECT SWITCHES

A. Wall mounted local AC disconnect with utility lockable, visible blade type switch.

B. See section 26 20 00 “Electrical Distribution Equipment” for additional requirements.

2.9 COMBINER AND JUNCTION BOXES

A. Combiner and junction boxes used to terminate and fuse PV arrays with other PV arrays shall be UL 1741 Listed.

B. Each PV array circuit shall be fused.

C. Enclosures shall be wall mounted, NEMA 3R and rated for 650 volt DC.

D. Enclosure shall have chassis ground.

2.10 MONITORING

A. A Data Acquisition and Monitoring System (DAS) shall be provided as shown on Drawings. DAS shall include, but not be limited to, the measurement, calculation, display, and reporting of the following items:
   1. PV production in 15-min reporting intervals.
   2. Energy consumption in 15-min reporting intervals.
   3. Weather data in 15-min reporting intervals.
   4. System electrical functions (instantaneous and accumulated power output (kW and kWh), AC and DC system voltage and amperage, inverter fault status, and peak value tracking with associated time stamps).
   5. Pounds of CO2 emissions avoided from the generation of PV energy at the site (compared to local utility fuel mix electric carbon content).
   6. DAS shall be capable of outputting data in the Western Renewable Energy Generation Information System (WREGIS) format sufficient for registering Renewable Energy Credits (RECs) from each system.
   7. Service to access data reported by DAS.
   8. DAS shall allow customer or customer’s third-party designee to programmatically access, view and download data through a web-based and mobile device Application Program Interface (“API”) at no cost to customer or customer’s third-party designee. This data shall, at a minimum, include the following data in accordance with Title 24 Part 6 Joint Appendix JA11.5.
      a. Nominal kW rating of the PV system.
      b. Number of PV modules and the nominal Watt rating of each module.
      c. Hourly (or 15-minute interval), daily, monthly, and annual kWh production in numeric and graphic formats.
      d. Running total of daily kWh production.
      e. Daily kW peak power production.
      f. Current kW production of the entire PV system.
      g. Energy consumption data.
      h. Inverter current data.
      i. Inverter voltage data.
      j. Inverter fault status.
      k. Weather station and/ or satellite data.
      l. Alarm status readings.

B. The DAS unit shall be a standalone, wall-mounted device powered by a 120 volt AC plug-in transformer with 24 volt DC output.

C. The unit shall provide user interface via standard web browser using an integrated Ethernet RJ45 jack.

D. Unit shall be capable of using LAN connections (static IP or DHCP), telephone modem or cell modem (GSM) for data upload.

E. Store all recorded variables in non-volatile memory.

F. Separate consumption and production meters shall be provided as shown on Drawings. Consumption meters shall include a web-enabled interface and 15-min reporting intervals to be synced with PV meter production intervals.

G. A weather station shall be provided as shown on plans. The station shall provide at a minimum: solar irradiation (coplanar and horizontal), ambient temperature, wind speed and any other data relevant to weather correction of solar PV system performance.

2.11 CONSTRUCTION AND INTERWIRING

A. The PV inverter shall be constructed in NEMA Type 3R outdoor enclosure, unless otherwise noted on the drawings.

B. Parts placement: The PV inverter shall be designed to permit ready access to modules and assemblies. Parts, test points and terminals shall be placed so that they are accessible for circuit checking, adjustment, and maintenance without the removal of any adjacent module or assembly.

2.12 SOURCE QUALITY CONTROL

A. Verification of performance:
   1. All PV equipment, including inverters, modules or panels, DAS, combiner boxes, etc., shall be inspected and tested in the Manufacturer's plant to demonstrate achievement of the system's power objectives and for full compliance with the requirements of the Contract Documents.

PART 3 EXECUTION

3.1 EXAMINATION

A. Contractor shall thoroughly examine Project site conditions for acceptance of PV power system installation to verify conformance with Manufacturer and Specification tolerances. Do not commence installation until all conditions are made satisfactory.

3.2 INSTALLATION

A. Install PV power system in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.

B. Installation, circuit requirements, disconnecting means, wiring methods, grounding and bonding, markings, signage, and interconnections shall conform to the requirements set forth in CEC Articles 690 and 705 and CFC Section 1204.

C. All equipment shall be anchored and braced to withstand seismic forces.

3.3 WIRE MANAGEMENT

A. Feeders and branch circuits for direct-current (DC) systems shall be type PV wire or USE-2/RHW-2 copper conductors rated minimum 650 V and shall be sunlight resistant.

B. All DC string wiring methods must meet or exceed current industry standards for wire management, strain relief and fastening.

C. All DC string wire management shall use stainless steel or galvanized steel cable clips, Heyco or similar. UV rated cable ties shall be used minimally and only in locations where the use of cable clips is impossible.

D. Wiring shall not be routed over sharp edges of structural members, equipment, or modules.

E. Wiring shall be routed under the modules of the array wherever possible to avoid direct exposure to the sun or elements.

F. Wiring shall be secured under the array to prevent excessive slack resulting in wire motion, and to minimize visibility of inter-module and home run wiring to the public.

G. Excess slack in the wire shall be secured such that it is in the module channel or secured to the junction box of the module. Factory-installed wire leads for modules can be wrapped around the junction box of the module.

H. Where exposed, wires, cables and conductors shall be managed in a neat and orderly manner. Where exposed to environmental conditions e.g. sunlight, rain, wind etc. and visible from below, wires shall be fastened in a uniform and discrete fashion.

I. Strain relief and drip loops shall be utilized at all entrances to and from conduit bodies, junction boxes, weather heads, switchgear, inverters and panelboards etc. Conductors shall be strapped with strain relief as not to stress panel leads, optimizer leads, home runs or mechanically crimped connections within the array. Sufficient slack shall be provided at both ends of cables to allow service and re-termination, and to prevent thermal expansion and contraction from stressing connections.

3.4 PV SYSTEM GROUNDING AND BONDING

A. Perform all PV system grounding and bonding in accordance with Part V of CEC Article 690.

B. The PV system shall include ground fault protection (including both detection and isolation) for DC circuits in accordance with CEC Article 690.41(B).

C. Provide connection to an equipment grounding conductor for all exposed non-current-carrying metal parts of PV module frames, electrical equipment, and conductor enclosures of PV systems in accordance with CEC Articles 250.134 or 250.236. Equipment Ground Conductors shall be sized in accordance with CEC Article 250.122.

D. Metallic support structures shall have identified bonding jumpers connected between separate metallic sections or shall be identified for equipment bonding and shall be connected to the equipment grounding conductor, per CEC Article 690.43(B).

E. Equipment ground conductors for the PV array and support structure shall be contained within the same raceway or cable as the PV system conductors, whose circuits leave the vicinity of the PV array per CEC Article 690.43(C).

F. Equipment grounding conductors for PV systems supported by buildings or structures shall be connected to grounding electrode systems in accordance with CEC Article 690.47(A) and Part III of Article 250.

3.5 PV MODULE MOUNTING AND GROUNDING DEVICES

A. Contractor shall follow the design for mounting and grounding PV modules to the racking structure. Any changes to the design must be approved by the owner. If the contractor would like to propose an alternate method, the proposed method shall utilize either of the following:
   1. UL 2703 listed module mounting and grounding clamps and devices.
   2. Direct bolting of the module to the racking structure and UL listed PV module grounding devices.

B. Where PV module clamps are allowed, the clamps must be approved for this purpose by their manufacturer as part of a UL 2703 listed assembly. Clamps shall be listed for PV module grounding to racking substrate, and their installation shall comply with the clamp installation manual and the PV module installation manual.

C. For canopy installations, if PV modules are direct bolted to the canopy steel structural purlins, mounting bolt size and specification must be written and detailed in the canopy structural drawings. Mounting bolt size must comply with the PV module installation manual and be compatible with the module mounting hole diameter.

D. Washer-type PV module grounding devices shall be listed for grounding PV modules to racking substrate and shall be installed according to the manufacturer's installation manual with appropriate bolt size and clearance hole size.

E. All PV modules shall be bonded to the racking structure with listed PV module grounding devices and equipment grounding conductors. An equipment grounding conductor shall ground the PV array to the PV inverter ground bar. In addition, the PV array must connect to the building's grounding electrode system, in compliance with CEC Article 690.47(A).

F. Where PV modules and steel racking systems are grounded and bonded, contact between dissimilar metals such as copper and galvanized steel shall be avoided. Where contact cannot be avoided, outdoor-rated conductive joint compound shall be applied between the interfacing metal surfaces.

3.6 RAPID SHUTDOWN DEVICES

A. Initiation of Rapid Shutdown shall be indicated by one of the following devices in the PV system, as required per CEC Article 690.12:
   1. Service disconnecting means.
   2. PV system disconnect.
   3. Readily accessible switch, plainly indicating "on" and "off" positions.

B. Controlled conductors within 1ft of the array shall be limited to not more than 80 volts within 30 seconds of rapid shutdown initiation.

C. Conductors more than 1ft away from the array shall be limited to not more than 30 volts within 30 seconds of rapid shutdown initiation.

3.7 MONITORING

A. Contractor shall load monitoring software (as applicable) on Owner provided computers and train Owner in operation and maintenance of software or cloud-based systems and related monitoring functions.

3.8 REQUIRED PLACARDS

A. Refer to CEC Articles 690 and 705 and CFC Section 1204 for requirements.

B. All placards shall be machine generated phenolic type with red background and white lettering, affixed to equipment with stainless steel screws or with permanent adhesive where set screws are not feasible. Minimum lettering size to be 1/4" unless otherwise noted or required for legibility.

C. Provide a placard clearly visible at each main service panel to identify the locations of all sources of power, as noted on drawings.

D. Provide a placard on all disconnects, as noted on drawings.

E. Provide a placard on the Main PV System Disconnect (adjacent to each main service panel), as noted on drawings.

F. Provide a placard on each PV System Inverter, as noted on drawings.

G. Provide placards as required by local utility company.

3.9 STARTUP AND FIELD QUALITY CONTROL

A. General:
   1. All work related to the startup of the solar PV system shall be by a factory-authorized service representative or installer.
   2. All programming, testing, trouble shooting, etc. shall be included in this contract.

B. Pre-functional testing:
   1. Provide Testing Agency with Contract Documents and Manufacturer instructions for installation and testing.
   2. Visual and mechanical inspection:
      a. Inspect for physical damage, defects alignment and fit.
      b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
      c. Compare nameplate information and connections to Contract Documents.
      d. Check tightness of all control and power connections.
      e. Check that all covers, barriers, and doors are secure.
      f. Verify interlock operation.
   3. Pretesting:
      a. Upon completing system installation, align and adjust the system and perform complete pretesting to determine conformance with the requirements of the Contract Documents. Correct any deficiencies observed in the pretesting. Replace all malfunctioning or damaged items and retest until satisfactory results are achieved.
      b. Insulation resistance tests of all buses, components, and control circuits.
      c. Continuity tests of circuits.
      d. Provide Testing Agency with Contract Documents and Manufacturer's instructions for installation and testing.

C. Functional performance testing:
   1. Contractor shall provide all tools and labor to perform the performance tests on the PV power system listed below.
   2. Test and verify all interlocks and shutdowns (including rapid shutdown).
   3. Furnish all meters and recording equipment required to fully document the tests and

the performance of the system and prepare typewritten reports of all tests. Review and sign all test reports attesting to their accuracy as required by the Engineer.

4. The operation of the equipment installation does not constitute an acceptance of the Work by the Owner. The final acceptance is to be made after the equipment has been adjusted and has demonstrated to the Engineer's satisfaction that if fulfills the requirements of the Plans and Specifications and Supplier has furnished all required certificates in accordance with testing procedures indicated.
5. Should it be found that the equipment or any portion thereof, furnished under this Section, fails to comply with the Specifications forming part thereof, with respect or regard to the quality amount or value of materials, appliances or labor used in the Work, it shall be rejected and replaced. All Work disturbed by changes necessitated in consequence of said defects or imperfections shall be restored to the original condition.
6. Contractor shall replace at no cost to the Owner all devices which are found defective or do not operate within factory specified tolerances.

D. In the event that the system fails to function properly during the testing as a result of inadequate pretesting or preparation, the Contractor shall bear all costs incurred by the necessity for retesting including test equipment, transportation, subsistence and Engineer's hourly rate.

E. Contractor shall submit the Testing Agency's final report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observations, deficiencies, and remedies. Include a copy of the test report in the Owner’s operation and maintenance manuals.

3.10 TRAINING

A. Provisions shall be made for an on-site 2-hour training program, one of the days shall be concurrent with the field-testing program. The training shall include, but not be limited to, a theoretical presentation of the PV power system and a thorough explanation and training in general operating procedures including system level troubleshooting, and access & use of the web-based monitoring software. The classes shall be for 3 to 6 students at the discretion of the Owner.

B. The Contractor shall furnish all materials, books, and other aids for each student at no charge to Owner.

C. Contractor shall schedule training with a minimum of 7-days advance notice.

END OF SECTION 26 31 00

SECTION 26 56 00 EXTERIOR LIGHTING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section specifies the furnishing, installation, and connection of exterior luminaires, controls, poles and supports.

B. Related Sections:
1. Section 26 05 00: Common Work Results for Electrical.
2. Section 26 05 19: Low-Voltage Electrical Power Conductors and Cables.
3. Section 26 05 26: Grounding and Bonding for Electrical Systems.
4. Section 26 05 33: Raceway and Boxes for Electrical Systems.
5. Section 26 51 00: Interior Lighting.

C. Reference Standards:
1. American Society for Testing and Materials (ASTM).
2. American Concrete Institute (ACI).
3. American National Standards Institute (ANSI).
4. Aluminum Association Inc. (AA).
5. Illuminating Engineering Society of North America (IESNA).
6. National Electrical Manufacturers Association (NEMA).
7. National Fire Protection Association (NFPA).
8. Underwriters Laboratories, Inc. (UL).

1.3 SUBMITTALS

A. Submit in accordance with Section 26 05 00: Common Work Results for Electrical.

B. Shop Drawings:
1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Include electrical ratings, dimensions, mounting, details, materials, required clearances, terminations, wiring and connection diagrams, photometric data, ballasts, poles, luminaires, effective projected area (EPA), lamps and controls.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment shall be in accordance with CEC, UL, ANSI, as shown on the drawings and as specified.

2.2 LUMINAIRES

A. UL 1598 and ANSI C136.17. Luminaries shall be weatherproof, heavy duty, outdoor types designed for efficient light utilization, adequate dissipation of lamp and ballast heat and safe

cleaning and relamping.

B. Light emitting diode (LED)-based solid state lighting (SSL) products shall be factory tested in accordance to the International Engineering Society (IES) LM-79 recommendations and meet ANSI C78.377-2008 standards.

C. LED light sources shall be factory tested in accordance to IES LM-80 recommendations.

D. LED-based SSL product shall incorporate an external heat sink, integral to the luminaire.

E. IESNA HB-9 and RP-8 light distribution pattern types shall be as indicated on the drawings.

F. Lenses shall be frame-mounted heat-resistant, borosilicate glass, prismatic refractors. Attach the frame to the luminaire housing by hinges or chain.

G. Pre-wire internal components to terminal strips at the factory.

H. Bracket mounted luminaries shall have leveling provisions and clamp type adjustable slip-fitters with locking screws.

I. Materials shall be rustproof. Latches and fittings shall be non-ferrous metal.

J. LED-based SSL luminaires shall be manufactured specifically for LED lamps with drivers integral to the luminaire housing.

2.3 LED-BASED SOLID STATE DRIVERS

A. Shall be listed by either U.L. or equal listing agency and comply with IEEE C.62.41-1991, Class A operation.

B. Provide a minimum power factor of 0.9.

C. Minimum operating temperature appropriate for outdoor environments.

D. Shall operate at a frequency greater than or equal to 120Hz.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install lighting in accordance with the CEC, as shown on the drawings, and in accordance with manufacturer's recommendations.

3.2 GROUNDING

A. Ground noncurrent-carrying parts of equipment including metal poles, luminaries, mounting arms, brackets, and metallic enclosures as specified in Section 26 05 26: Grounding and Bonding for Electrical Systems. Where copper grounding conductor is connected to a metal other than copper, provide specially treated or alloyed connectors suitable and listed for this purpose.

END OF SECTION 26 56 00

SECTION 27 00 00 - BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.01 RELATED WORK

A. The entire drawing and specification package apply to the work specified in the telecommunications sections of the specifications and shall be complied with in every respect. The Contract Documents are comprised of the drawings and specifications. The Contractor shall examine these Contract Documents, and coordinate required work indicated in each.

1.02 SCOPE OF WORK

A. The work covered by the specifications includes furnishing materials, labor, transportation, tools, permits, fees, utilities, and incidentals necessary for the complete installation of work required in the Contract Drawings.

B. It is the intent of the Contract Documents to provide an extension of the existing installed systems interfaced with new systems, complete in every respect.

C. The Contractor shall be responsible for coordination and proper relation of his work to the building structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with the existing site conditions, details of the work and the working conditions, and verify dimensions in the field. The Contractor shall advise the Engineer of any discrepancy prior to bidding. The submission of bids shall be deemed evidence of the Contractor's site visit; coordination of existing conditions and include consideration for existing conditions.

D. Provide line-by-line specification review for each Division 27 section annotated to certify compliance or deviation.

E. Comply with all applicable construction standards listed out on Lodi USD website at https://www.lodiusd.net/about/projects with direct reference to the Telecommunications Specifications and Installation Standards.

1.03 DRAWINGS AND SPECIFICATIONS

A. The drawings and these specifications are complementary to each other, and what is required by one shall be as binding as if required by both.

B. If variations or departures from the drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted to the Engineer for review. No departures shall be made without prior written acceptance of the Engineer.

C. Should the drawings or specifications disagree in themselves or with their counterpart, the better quality or greater quantity of work or materials shall be estimated upon, and unless otherwise directed by the Engineer in writing, shall be performed or furnished. In case the specifications should not fully agree with the Schedules, the latter shall govern. Figures indicated on drawings govern scale measurements and large scale details govern small scale drawings.

D. Items specifically mentioned in the specifications but not shown on the drawings and/or items shown on the drawings but not specifically mentioned in the specifications shall be installed

by the Contractor under the appropriate section of work as if they were both specified and shown.

1.04 CODES AND STANDARDS

A. All work shall comply with the applicable articles of the National Electrical Code, the National Electrical Safety Code, the National Fire Codes (published by National Fire Protection Association), and City Codes and Ordinances, as well as any other authorities that may have lawful jurisdiction pertaining to the work specified. None of the terms or provisions of this specification shall be construed as waiving any of the rules, regulations, or requirements of these authorities.

B. Contractor is responsible for knowledge and application of current versions of all applicable standards and codes. In cases where listed standards and codes have been updated, Contractor shall adhere to the most recent revisions, including all relevant changes or addenda at the time of installation.

C. ANSI/TIA:

1. ANSI/TIA-526-7-A (July 2015) Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant
2. TIA-526.2-A (July 2015) Effective Transmitter Output Power Coupled into Single-Mode Fiber Optic Cable - Adoption of IEC 61280-1-1 ed. 2 Part 1-1: Test Procedures for General Communication Subsystems – Transmitter Output Optical Power Measurement for Single-Mode Optical Fiber Cable
3. ANSI/TIA-4994 (March 2015) Standard for Sustainable Information Communications Technology
4. ANSI/TIA-526-14-C (April 2015) Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant
5. ANSI/TIA-568.0-D (September 2015) Generic B (supersedes TIA-568-C.0 and TIA-568-C-1)
6. ANSI/TIA-568.1-D (September 2015) Commercial Building Telecommunications Infrastructure Standard (supersedes ANSI/TIA-C.1)ANSI/TIA-568.2-D (September 2018) Balanced Twisted-Pair Telecommunications Cabling and Components Standard
7. ANSI/TIA-568.3-D (June 2016) Optical Fiber Cabling Components Standard
8. ANSI/TIA-568.4-D (August 2020) Broadband Coaxial Cabling Components Standard
9. ANSI/TIA-569-E (May 2019) Telecommunications Pathways and Spaces
10. ANSI/TIA-598-D (July 2014) Optical Fiber Cable Color Coding
11. ANSI/TIA-570-C (August 2012) Residential Telecommunications Infrastructure Standard
12. ANSI/TIA-606-C (June 2017) Administration Standard for Telecommunications Infrastructure
13. ANSI/TIA-607-D (July 2019) Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
14. ANSI/TIA-758-B (March 2012) Customer-Owned Outside Plant Telecommunication Infrastructure Standard
15. ANSI/TIA-862-B (February 2016) Structured Cabling Infrastructure Standard for Intelligent Building Systems
16. ANSI/TIA-942-B (July 2017) Telecommunications Infrastructure Standard for Data Centers
17. ANSI/TIA-1005-A (May 2012) Telecommunications Infrastructure Standard for Industrial Premises
18. ANSI/TIA-1005-A-1 (January 2015) Telecommunications Infrastructure Standard for Industrial Premises, Addendum 1- M12-8 X-Coding Connector - Addendum to TIA-1005-A
19. ANSI/TIA-1183 (August 2012) Measurement Methods and Test Fixtures for Balun-

Less Measurements of Balanced Components and Systems
20. ANSI/TIA-1183-1 (January 2016) Measurement Methods and Test Fixtures for Balun-Less Measurements of Balanced Components and Systems, Extending Frequency Capabilities to 2 GHz - Addendum to TIA-1183
21. TIA-1152 (November 2016) Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling
22. TIA-1179-A (September 2017) Healthcare Facility Telecommunications Infrastructure Standard
23. ANSI/TIA-4966 (May 2014) Telecommunications Infrastructure Standard for Educational Facilities
24. TIA-455-104-B (February 2016) FOTP 104- Fiber Optic Cable Cyclic Flexing Test (supersedes TIA-455-104-A)
25. TIA/EIA-455-25-D (February 2016) FOTP-25 Impact Testing of Optical Fiber Cables
26. TIA-604-18 (November 2015) FOCIS 18 Fiber Optic Connector Intermateability Standard – Type MPO-16
27. TIA-604-5-E (November 2015) FOCIS 5 Fiber Optic Connector Intermateability Standard- Type MPO
28. TIA-5017 (March 2016) Telecommunications Physical Network Security Standard
29. TIA-TSB-155-A (Reaffirmed 10-6-2014) Guidelines for the Assessment and Mitigation of Installed Category 6 Cabling to Support 10GBASE-T
30. TSB-184 (July 2009) Guidelines for Supporting Power Delivery Over Balanced Twisted-Pair Cabling
31. TSB-4979 (August 2013) Practical Considerations for Implementation of Multimode Launch Conditions in the Field
32. TSB-190 (June 2011) Guidelines on Shared Pathways and Shared Sheaths
33. TIA-TSB-162-A (November 2013) Telecommunications Cabling Guidelines for Wireless Access Points
34. TSB-5018 (July 2016) Structured Cabling Infrastructure Guidelines to support Distributed Antenna Systems
35. TIA-492AAAE (June 2016) Detail Specification for 50-µm Core Diameter/125-µm Cladding Diameter Class 1a Graded-Index Multimode Optical Fibers with Laser-Optimized Bandwidth Characteristics Specified for Wavelength Division Multiplexing
36. TIA-492AAAB-A (November 2009) Detail specification for 50-µm core diameter/125-µm cladding diameter class Ia graded-index multimode optical fibers
37. TIA-455-243 (March 2010) FOTP-243 Polarization-mode Dispersion Measurement for Installed Single-mode Optical Fibers by Wavelength-scanning OTDR and States-of-Polarization Analysis
38. TSB-172-A (February 2013) Higher Data Rate Multimode Fiber Transmission Techniques

D. ISO/IEC:
1. ISO/IEC TR 11801-99-01 Information technology – Generic cabling for customer premises: Guidance for balanced cabling in support of at least 40 GBit/s data transmission: Parts 1 and 2
2. ISO/IEC TR 29106 AMD 1 Information technology -- Generic cabling -- Introduction to the MICE environmental classification
3. ISO/IEC 24764 AMD 1 Information technology – Generic cabling for data centers
4. ISO/IEC 11801 AMD 1 AMD 2 Information technology – Generic cabling for customer premises
5. ISO/IEC 15018 AMD 1 Information technology – Generic cabling for homes
6. ISO/IEC 24702 AMD 1 Information technology – Generic cabling – Industrial premises
7. ISO/IEC 14763-1 AMD 1 Information technology – Implementation and operation of customer premises cabling – Part 1: Administration
8. ISO/IEC 14763-2 Information technology – Implementation and operation of customer

premises cabling – Part 2: Planning and installation
9. ISO/IEC 14763-2-1 Information technology – Implementation and operation of customer premises cabling – Part 2-1: Planning and installation – Identifiers within administration systems
10. ISO/IEC 14763-3 Ed 2.0 Information technology -- Implementation and operation of customer premises cabling -- Part 3: Testing of optical fiber cabling
11. ISO/IEC TR 24704 Information technology – Customer premises cabling for wireless access points
12. ISO/IEC TR 24750 Information technology – Assessment and mitigation of installed balanced cabling channels in order to support 10GBASE-T
13. ISO/IEC TR 29125 IT Telecommunications cabling requirements for remote powering of terminal equipment

E. BICSI – Building Industry Consultative Services International – Published Standards
1. ANSI/BICSI 001-2009, Information Transport Systems Design Standard for K-12 Educational Institutions
2. ANSI/BICSI 002-2014, Data Center Design and Implementation Best Practices
3. ANSI/BICSI-003-2014 Building Information Modeling (BIM) Practices for Information Technology Systems
4. BICSI 004-2012, Information Technology Division Systems Design and Implementation Best Practices for Healthcare Institutions and Facilities
5. ANSI/BICSI 005-2016, Electronic Safety and Security (ESS) System Design and Implementation Best Practices
6. BICSI 006-2015 Distributed Antenna System (DAS) Design and Implementation Best Practices
7. ANSI/NECA/BICSI 568-2006, Standard for Installing Commercial Building Telecommunications Cabling
8. NECA/BICSI 607-2011, Standard for Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings
9. BICSI – Building Industry Consultative Services International – Manuals
10. Telecommunications Distribution Methods Manual, 14th Edition (2020)
11. Information Transport Systems Installation Methods Manual (ITSIMM), 6th Edition
12. Outside Plant Design Reference Manual, 5th Edition
13. BICSI's ICT Terminology Handbook, Version 1.0
14. Telecommunications Project Management Manual (TPMM), 1st edition
15. Telecommunications Project Management Reference Document (TPMRD), 2nd Edition
16. BICSI's Special ICT Design Considerations, Version 1.0
17. Essentials of Bonding and Grounding, Version 1.0

F. National Electric Codes
1. National Electrical Safety Code (NESC) (IEEE C2-2012)
2. NFPA 70-2020, National Electrical Code© (NEC©)
3. ANSI/IEEE C2-207, National Electrical Safety Code®
4. National Electrical Code (NEC) (NFPA 70)
5. NFPA 72 National Fire Alarm and Signaling Code

G. ASHRAE
1. ASHRAE Standard 90.4P, Energy Standard for Data Centers and Telecommunications Buildings

H. OSHA Standards and Regulations – all applicable

I. Local Codes and Standards – all applicable

J. Anywhere cabling standards conflict with one another or with electrical or safety codes,

Contractor shall defer to the NEC and any applicable local codes or ordinances, or default to the most stringent requirements listed by either.

K. Knowledge and execution of applicable standards and codes is the sole responsibility of the Contractor.

L. Any violations of applicable standards or codes committed by the Contractor shall be remedied at the Contractor's expense.

M. In any instance where these Specifications call for materials for construction of a better quality or larger size than required by the codes, the provisions of these Specifications shall take precedence. The codes shall govern in case of direct conflict between the Codes and the Drawings.

1.05 EXISTING UTILITIES

A. The Contract Documents reflect the general location and routing for all telecommunications services known to exist on this project.

1.06 BUILDING CONSTRUCTION AND LAYOUT OF WORK

A. General: It shall be the responsibility of the Contractor to consult the Engineering Drawings and Details so as to thoroughly familiarize himself with the type and quality of construction to be provided on this project.

B. The drawings are diagrammatic in nature and do not show every connection in detail or every line or conduit in its exact location. These details are subject to the requirements of all codes and ordinances as well as all structural and architectural conditions. The Contractor shall carefully investigate structural and finish conditions and shall coordinate the separate trades in order to avoid interference between the various phases of work. Work shall be laid out so that it will be concealed in furred chases unless specifically noted or indicated to be exposed. Work shall be installed to avoid crippling of structural members; therefore, inserts to accommodate conduit hangers shall be set before concrete is poured, and proper openings through floors, walls, beams, etc. shall be provided as hereinafter specified or as otherwise indicated or required before concrete is poured. All work shall be run parallel or perpendicular to the lines of the building unless otherwise noted.

C. The approximate location of equipment items is indicated on the drawings. Exact locations are to be determined by coordination of dimensions from approved equipment submittals and site-verified field measurements and will in all cases be subject to the approval of the Engineer. The Engineer reserves the right to make any reasonable changes in the indicated locations prior to installation for no additional cost.

D. In areas of existing special ceiling construction the removal and restoration must be carefully planned such that the existing condition of the ceilings is maintained. It may be necessary for the Contractor to procure a Subcontractor familiar with this work to achieve this requirement.

PART 2 – PRODUCTS

2.01 GENERAL MATERIALS AND EQUIPMENT REQUIREMENTS

A. Materials, in general, shall conform to the National Electrical Code requirements and

shall be listed, inspected, and approved by the Underwriters Laboratories and shall bear the UL label where labeling service is available. The label or listing of the Underwriters Laboratories, Inc. will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this listing, the Contractor may submit a statement from a nationally recognized, adequately equipped testing agency, indicating that the items have been tested in accordance with required procedures, and that the materials and equipment comply with all Contract requirements.

2.02 STANDARD PRODUCTS

A. Materials and equipment shall be the standard catalog products of manufacturers regularly engaged in the manufacture of products conforming to these specifications, and shall essentially duplicate materials and equipment that have been in satisfactory use at least two (2) years prior to bid opening. Where custom or special items are required, these shall be fully described using drawings, material lists, etc., which fully describe in detail the item proposed for use on this project.

2.03 MANUFACTURER'S INSTRUCTIONS

A. The Contractor is responsible for furnishing the proper telecommunications equipment and/or material and for seeing it is installed as intended by the manufacturer. The Contractor shall, wherever necessary, request advice and supervisory assistance from equipment manufacturers as required for the proper installation, operation, or start-up. The Contractor shall notify the Engineer in writing of any conflict between the Contract Documents and the manufacturer's recommendations and shall obtain from the Engineer instructions/direction before proceeding with the work. The Contractor shall pay for all costs resulting from deficiencies created by installation not in accordance with the manufacturer's recommendations or the instructions of the Engineer.

2.04 RUST PREVENTION

A. Metallic materials shall be protected against corrosion. Exposed metallic parts of equipment exposed to the elements shall be given a rust inhibiting treatment and standard finish by the manufacturer. Components such as boxes, bodies, fittings, guards, and miscellaneous parts shall be protected in accordance with the ASTM A123 or A153, except where other equivalent protective treatment is specifically approved in writing.

2.05 STORAGE AT SITE

A. The Contractor shall not receive material or equipment at the job site until ready for installation or until there is suitable space provided to properly protect equipment from rust, weather, humidity, dust, or physical damage.

2.06 CONDITION OF MATERIALS

A. All materials required for the installation of the telecommunications systems shall be new and unused. Any material or equipment damaged in transit from the factory, during delivery to premises, while in storage on premises, while being erected and installed, or while being tested, until time of final acceptance, shall be replaced by this Contractor without extra cost to Owner.

2.07 NAMEPLATES

A. Factory assembled components and equipment shall be provided with embossed nameplates, securely attached to the equipment with rivets or screws. Nameplates will

have information required to specifically identify the equipment in the future such as the manufacturer's name, address, catalog number, serial number, etc. All data on nameplates shall be legible at the time of final inspection.

PART 3 – EXECUTION

3.01 ACCEPTABLE MANUFACTURERS

A. The specifications contain the names of manufacturers which are considered acceptable based on the quality of the product.

B. Where acceptable manufacturers are listed, only products of those manufacturers may be provided. Additionally, the product must meet all the detailed requirements of the specifications.

C. If no manufacturer's name is mentioned, the Contractor shall provide equipment and material which meet the specifications.

D. The drawings represent the manufacturer's equipment scheduled. The listing of acceptable manufacturers in the specifications is not intended to imply that equipment of these other manufacturers will fit in the space provided or have the same electrical, structural or other requirements as the equipment scheduled. The Contractor must ensure that the equipment provided will meet all project requirements prior to submitting data on that equipment.

3.02 SPACE AND EQUIPMENT ARRANGEMENT

A. Equipment and components shall be installed in a manner to permit access to parts requiring service. Telecommunications equipment shall be installed in such a manner as to allow removal for service without disassembly of adjacent equipment.

B. Large equipment or apparatus which is to be installed in the building, and which is too large to permit access through stairways, doorways, or shafts shall be brought to the job and placed in the space before the enclosing structure is completed. Following placement in the space, such apparatus shall be thoroughly protected from damage.

C. Equipment shall have working clearances as required by applicable codes and standards.

3.03 SUBMITTAL AND REVIEW OF MATERIALS

A. After the Contract is awarded, but prior to proceeding with the Work, the Contractor shall obtain, check, certify, and submit complete Shop Drawings and Brochures from Manufacturers, Suppliers, Vendors, etc., for all materials and equipment specified herein. Submit Shop Drawings and Brochures in sufficient time so as not to impede the progress of work. Three weeks will be required for the processing of Shop Drawings and Brochures in the Engineer's office, exclusive of transmittal time. This time shall be considered by the Contractor when scheduling submittal data. After the Contract is awarded, the Contractor will advise the Engineer in writing of the schedule for submission of shop drawings and product data and the persons authorized to sign submittal data on behalf of the Company.

B. District Standard Compliance: Contractor shall attach a copy of the Telecommunications Specifications and Installation Standards PDF (English) found at https://www.lodiusd.net/about/projects indicating compliance and adherence to all district standards of telecommunication installation means and methods.

C.

D. The Engineer's review of Shop Drawings and Brochures shall not relieve the Contractor of the responsibility for dimensions, errors that may be contained therein, or deviations from Contract Document requirements. It shall be clearly understood that the Engineer's noting some errors but overlooking others does not grant the Contractor permission to proceed in error. Regardless of any information contained in the Shop Drawings, the requirements of the Contract Documents shall govern and are not waived or superseded in any way by the submittal data review.

E. Before submission of Shop Drawings and Brochures, the Contractor shall certify that each Shop Drawing and each item of material or equipment complies with the Contract Documents for this Project. Such certification shall be made by the Owner, a Partner, a Corporate Officer of the Contractor, or by a person duly authorized to sign for the Contractor. Unless so certified, Shop Drawings and/or Brochures will be returned for resubmittal. Certifications shall be in the form of rubber stamp impressions or typed letter which states:

I hereby certify that this Shop Drawing and/or brochure and the equipment and material shown on this Shop Drawing and/or Brochure complies in all aspects (except as noted*) with the requirements of the Contract Documents for this Project. I further certify that all data shown herein as to performance, dimensions, construction, materials, and other pertinent items are true and correct.

Name of Contractor_____

Signed_____

Position_____

Date_____

*Refer to exception requirements herein.

F. Each Shop Drawing shall indicate in the lower right hand corner and each Brochure shall indicate on the front cover the following: Title of the Sheet or Brochure; name and location of the building; names of the Engineer, Contractor, Manufacturer, Supplier, Vendor, etc., the date of submittal; and the date of each correction and revision. So far as is practical, each Shop Drawing and/or Brochure shall bear a cross-reference note to the sheet number or numbers of the Contract Drawings and Specifications showing the same work. Shop Drawings and Brochures shall be prepared as follows:

1. Shop Drawings: Drawings shall be newly prepared and not reproduced from the Contract Documents, drawn to a scale that can be easily read and shall contain sufficient plans, elevations, sections, and isometrics to describe clearly the items in question. Drawings shall be prepared by a draftsman skilled in this type of work. All equipment layouts and similar Shop Drawings shall be drawn to at least 1/4-inch = 1'-0" scale.

2. All Shop Drawings shall indicate the equipment actually purchased. The elevation, location, support points, load imposed on the structure at support and anchor points, shall be indicated. All beam penetrations and slab penetrations shall be indicated and sized and shall be coordinated. All Design Drawing space allocations shall be maintained, such as ceiling height, chase walls, equipment room size, etc., unless proper written authorization is required from the Engineer to change them. All associated equipment shall be coordinated and clearly shown on the Shop Drawings.

3. Brochures: Brochures submitted to the Engineer shall be published by the Manufacturers and shall contain complete and detailed engineering and dimensional information to show that the equipment will fit into the allotted space.

4. Brochures submitted shall contain only information which is relevant to the particular equipment or materials to be furnished. Do not submit catalogs that describe several different items other than those items to be used unless all irrelevant information is marked out or relevant information is clearly marked.

G. The submittal format shall follow the Specifications format with a submittal required for each required section. The submittal shall be contained in a three-ring hard back binder. Copies of each submittal shall be three-hole punched and arranged (or folded if required) for the Engineer's filing convenience. Provide one copy of updated TABLE OF CONTENTS and progressive-tabbed index sheets also for the Engineer's filing convenience.

H. Submittal data for each section must be complete. Partial submittals will not be reviewed. To the greatest extent possible all sections shall be submitted with the first submission. No more than three additional submissions will be allowed to complete the submittal package.

I. Unless a greater number is indicated within Division One of these specifications, submit six (6) copies of all Brochures for review. Submit one (1) reproducible and one (1) blueprint of shop drawings for review. Comments will be made on the reproducible to facilitate copying.

J. Any submittal that is disapproved must be resubmitted within two (2) weeks following notification of such disapproval. If no satisfactory material is submitted within the two-week period, the Engineer reserves the right to require the Contractor to furnish items exactly as described in the Contract Documents.

K. No allowances will be made for submittals which are not made in a timely fashion or which are turned down because they do not meet the specifications. Should delivery problems arise due to the above, affecting the completion time of the project, the Contractor will furnish and install acceptable alternates until the proper materials arrive and then replace the alternate materials with the approved materials, all at no cost to the Owner. If the Contractor is not able to furnish an acceptable alternate until the proper materials arrive, he will assume all costs for furnishing and installing all alternates as directed by the Engineer and/or will pay a suitable penalty for the inconvenience experienced by the Owner. This penalty will be set by the Owner based on the particular circumstances.

3.04 SUPERVISION

A. A competent certified foreman or superintendent, approved by the Engineer, shall be maintained at the project site to receive instructions and to act for the Contractor. Once this superintendent has been approved, no change shall be made without approval of the Owner or his authorized representative. The Owner and his authorized representative shall have the right to observe the work at any time. The Contractor shall have a representative present when his work is being observed, and he shall give assistance as required.

3.05 CUTTING AND PATCHING

A. Where it is necessary to cut through walls, floors, or ceilings to permit installation of work under this section of the Contract, or to repair any defects that may appear, up to the expiration of guarantee period, such cutting shall be done under the supervision of the

Engineer. The Contractor shall not be permitted to cut or modify any structural members without the written permission of the Engineer.

B. Patching of all openings and repairing of any damage to the work of other trades occasioned by cutting operations, or occasioned by the failure of any part of work installed under this Contract, shall be performed by the trade whose work is involved, and shall be paid for by the Contractor.

C. Openings cut through exterior walls or roofs shall be provided with suitable covers to protect the property or materials involved. Openings cut through walls below grade shall be properly protected to prevent entrance of water or other foreign elements. Openings cut between fire zones or plenums shall be sealed to maintain the fire integrity of the wall or floor. Conduits and cable tray through plenum wall shall be sealed using materials complying with UL 1479, NEC 300-21, and NEC 800-3(C), and shall be UL classified.

3.06 HOISTING, SCAFFOLDING, AND TRANSPORTATION

A. Provide hoisting and scaffolding facilities as required to set materials and equipment in place.

3.07 CLEANING

A. The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish. Debris shall be removed from the site and from any street or alley adjacent to the site.

B. At completion of the project, the Contractor shall remove all tools, scaffolding, and surplus materials. Contractor shall leave the area "broom clean". Before final acceptance, vacuum all panels, cabinets, racks and other equipment enclosures. Wipe clean all fixture lenses and reflectors, all panelboard and switchboard interior and exterior surfaces, being careful to remove all stray paint, construction materials, dust, and particles. Touch-up all marred surfaces to restore existing conditions to those provided by the manufacturer.

3.08 CONDUIT SLEEVES

A. Where conduits pass through walls or floors not on fill, galvanized sheet metal sleeves shall be provided and shall be sealed to prevent air and noise transmission. In walls, they shall be flush with each finished surface. In pipe chases, they shall extend 1-1/2 inches above floor slab and be cemented in a water tight manner. Size of these sleeves shall be at least 1/2 inch greater than outside diameter of the conduit.

B. For conduits passing through outside walls, provide and install galvanized steel sleeves having an inside diameter at least 4 inches greater than the outside diameter of contained conduit. Where these occur in walls having a waterproof coating applied, the sleeves shall have welded flanges to build into waterproofing. When conduits are installed, the annular space between pipe and sleeve shall be effectively sealed, using shredded lead hammered in place or an approved mastic sealer.

C. Pipe and duct sleeves, pitch pockets, and flashings compatible with the roofing installation shall be provided for roof penetrations.

3.09 GROUNDING

A. Ground buses shall be provided in each Telecommunications room by Division 16 Contractor unless noted on Contract Drawings.

B. Telecommunications grounding system shall be a single point grounding from the building entrance electrical ground to each Telecommunications room. This Grounding system shall be provided by Division 16 Contractor unless notes on Contract Drawings.

C. All Conduit systems, cabinets' racks, cable trays, protector blocks, SCTP patch panels and/or miscellaneous equipment, etc. shall be grounded by being connected to the common telecommunications grounding system. The conductors shall be a # 6awg solid with a green jacket

3.10 RECEDENCE OF WORK

1. This Contract includes many different systems furnished and installed by different trades. All trades shall coordinate their work with that of all other trades so that it may be installed in the most direct and workmanlike manner without hindering or handicapping other trades.

3.11 RECORD DRAWINGS

A. The Contractor shall keep a set of Drawings on the job, noting daily all changes made in these Drawings in connection with the final installation, including exact dimensioned locations of all new and uncovered existing active and inactive utilities outside the building, and shall turn over a clean, neatly marked set of mylar reproducible Drawings showing "as-installed" work to the Engineer for delivery to the Owner. All underground utilities, services, and systems shall be accurately located by the Contractor and dimensioned on the "as-installed" Drawings.

3.12 OPERATING AND MAINTENANCE MANUAL

A. The Contractor shall furnish indexed operating and maintenance manuals with complete technical data for each system, piece of equipment, and material installed under this Contract.

B. Two (2) copies of the manual, bound in hardback binders or an approved equivalent, shall be provided. One copy shall be completed and delivered to the Engineer prior to the time that system and equipment tests are performed. The second copy shall be delivered prior to final acceptance.
   1. Provide one (1) operation and Maintenance manual for each building. Provide one (1) as-built floor plan and one CD for each building.

C. The manual shall include the following information
   1. Manufacturer's installation instructions.
   2. Manufacturer's local representative and/or distributor's name and address.
   3. Manufacturer's operating and maintenance instructions.
   4. Manufacturer's internal wiring diagrams.
   5. Contractor's installation wiring diagrams.
   6. Replacement part number listings and descriptions.
   7. Framed operating instructions, when required, in individual Specification sections.
   8. Warranties and guarantees.
   9. Provide an approved submittal at the front of each section.

D. The manuals shall be identified on the cover as "Operating and Maintenance Manual" with additional cover display of the name and location of project, the Owner, the Engineers, the General Contractor, and the Subcontractors installing equipment represented in the brochure.

E. The manual shall have a Table of Contents and shall be grouped in sections according to the sections of Division 27. Each section shall have a copy of the pages of the Specifications covered within the section. Sections shall be organized as follows:
   1. Each section in the manual shall identify the grouping of all literature required for the system or equipment included.
   2. The contents of each section shall be arranged in the following sequence: First, the approved engineering submittals with complete performance and technical data; second, the manufacturer's installation brochure; third, the manufacturer's operating and maintenance brochure; fourth, the manufacturer's installation wiring diagram; fifth, the Contractor's field wiring diagram, if different; and sixth, the manufacturer's brochure listing replacement part numbers and description.
   3. Provide a final section entitled, "Warranties and Guarantees", for all equipment, etc.

3.13 EXISTING FACILITIES

1. The Contractor shall be responsible for loss or damage to the existing facilities and shall be responsible for repairing or replacing such loss or damage. The Contractor shall send proper notices and receive written permission from the Owner to enter existing areas. Before beginning work in existing areas, the Contractor shall make necessary arrangements and perform other services required for the care, protection, and in-service maintenance of all electrical, communication, plumbing, heating, air condition, and ventilating services for new and existing facilities. The Contractor shall erect temporary barricades with necessary safety devices to protect personnel from injury, removing all such temporary protection upon completion of the work.

2. The Contractor shall provide temporary or new services to existing facilities as required to maintain their proper operation when normal services are disrupted as a result of the work being accomplished under this project.

3. Where existing construction is removed to provide working and extension access to existing utilities, the Contractor shall remove doors, piping, conduit, outlet boxes, wiring, light fixtures, air condition ductwork, and equipment, etc. to provide this access and shall reinstall same upon completion of work.

4. Where partitions, walls, floors, or ceilings of existing construction are indicated to be removed, the Contractor shall remove and reinstall in locations approved by the Engineer all devices required for the operation of the electrical systems installed in the existing construction. This is to include, but is not limited to, temperature control system devices, electrical switches, relays, fixtures, piping, conduit, etc.

3.14 DEMOLITION AND RELOCATION

1. The Contractor shall modify, remove, and relocate all materials and items so indicated on the drawings or required by the installation of new facilities. All removals and/or dismantling shall be conducted in a manner as to produce maximum salvage. Salvage materials shall remain as directed by the Owner. Materials and items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to the approval of the Owner. The Contractor may substitute new materials and items of like design and quality in lieu of materials and items to be relocated, if approved by the Owner.

2. All items scheduled for relocation and/or reuse shall be inspected by the Contractor and the Owner or his authorized representative. A written report of the condition of each item shall be made and provided to the Engineer. Where items scheduled for relocation and/or reuse are considered unsuitable for reuse, the Contractor shall so notify the Engineer and await reinstallation instructions before proceeding with removal. Items damaged in reinstallation

shall be repaired or replaced by the Contractor as directed by the Owner at not additional cost to the Owner or the Engineer.

3. All items which are to be relocated shall be carefully removed in reverse to original assembly or placement and protected until relocated. The Contractor shall clean, repair, and provide all new materials, fittings, and appurtenances required to complete the relocation and to restore the items to good operative order. All relocations shall be performed by workmen skilled in the work ad in accordance with standard practice of the trades involved.

4. Service lines and wiring to items to be removed, salvaged, or relocated shall be removed to points as indicated on the drawings, specified, or acceptable to the Owner. Service lines and wiring not scheduled for reuse shall be removed to the points at which reuse is to be continued or service is to remain. Such services shall be sealed, capped, or otherwise tied off or connections into the existing facilities in such a manner as to result in minimum interruption of services to adjacent occupied areas. Services to existing areas or facilities which must remain in operation during the construction period shall not be interrupted without prior specific written approval of the Engineer.

3.15 OUTAGES

1. Outages of services as required by the project will be permitted, but only at a time approved by the Owner. The Contractor shall notify the Owner in writing two (2) weeks in advance of the requested outage in order to schedule required outages. No outages shall be taken unless written approval has first been received from the Owner. The time allowed for outages will not be during normal working hours unless otherwise approved by the Owner. All costs of outages, including overtime charges, shall be included in the Contract amount.

END OF SECTION

SECTION 27 10 00 – CATEGORY 6A STRUCTURED CABLING SYSTEM (SCS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Lodi Unified School District Telecommunications Specifications found on LUSD website at https://www.lodiusd.net/about/projects

a. All Specifications set forth herein are intended to supplement and enhance the existing district standards as delineated in the aforementioned document. However, these Specifications shall not supersede, override, or take precedence over the conditions, terms, or requirements stipulated therein, which shall remain controlling in the event of any conflict or inconsistency.

1.2 RELATED WORK

A. 26 05 00 – Grounding and Bonding
B. 26 05 29 – Electrical Hangers and Supports
C. 26 05 33 – Raceway and Boxes

1.3 DESCRIPTION

A. Summary of Work:
1. Provide a new, complete, and tested Category CAT6A cable distribution system for data interconnections (Local Area Network) in new portable buildings, and in all reconstructed areas as indicated on drawings. The data distribution system shall include fully terminated unshielded twisted pair cables, raceways, conduit, UTP termination devices, data communications outlets, patch panels, patch cables, network racks, and other incidental and miscellaneous premises wiring system hardware as required for a complete and usable system. The installation shall comply with all applicable codes and standards in effect at the job site and as indicated in the Drawings and Specifications.
2. Comply with all applicable construction standards listed out on Lodi USD website at https://www.lodiusd.net/about/projects with direct reference to the Telecommunications Specifications and Installation Standards.

1.4 QUALITY ASSURANCE

A. Acceptable manufacturers:
1. The equipment/products described herein, and furnished per these specifications shall be the product of one manufacturer. All references to model numbers and other detailed descriptive data are intended to establish standards of design performance, and quality, as required.
2. Acceptable product manufacturers shall provide a complete category 6 solution as manufactured by **Panduit only**. No other manufacturers will be allowed.

B. Installer Qualifications:
1. The Data Cable System Installer shall be licensed and shall meet all applicable regulations of the State of Texas and Department of Labor insofar as they apply to this type of system. The proposer shall be a firm normally employed in the low

voltage and data cabling industry and shall provide a reference list of ten (10) large-scale projects and contact names confirming successful Category 6 premises wiring system installations.

2. All Data Cable Systems installation shall be performed by a (BICSI) Certified - Registered Telecommunications Technician or under the direct supervision of a (BICSI) Certified - Registered Communications Distribution Designer (RCDD).
3. Contractor shall be a current Panduit One^{SM} Partner and at least a Registered Tier level Partner that has completed the Structured Cabling Deployment training (Panduit Certified Installer). A copy of the corporate Panduit manufacturer certification shall be included with all quotes.
4. The proposing contractor and the installing contractor must be the same company. No subcontractor to the proposing SCS contractor will be allowed for any portion of the SCS scope of work.

C. Pre-Construction Meeting:
1. The successful Contractor shall attend a mandatory pre-construction meeting with individuals deemed necessary by the Owner's representative prior to the start of the work.

D. Acceptance:
1. The Owner's representative reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

E. Warranty:
1. The selected system installer shall be a certified installing contractor of product and hold current certification. Contractor shall provide an end-to-end performance warranty of no less than 20 years. The warranty shall be the maximum provided by the manufacturer. The proposer shall provide current certification documentation. The performance warranty shall be issued by the manufacturer and shall warrant that ALL Category 6 cable links have been tested bi-directionally (end to end) using a Level 2 tester, per TSB-67, and that all test results conform to the most current TIA/EIA-568-A and/or TSB-67 Link values.
2. The warranty will also cover multimode fiber optic cabling. Performance testing shall be conducted in accordance with ANSI/EIA/TIA-526-14 Standard, method B.
3. The warranty will stipulate that all products used in this installation meet the prescribed mechanical and transmission specifications for such products as described in ISO/IEC 11801, ANSI/TIA/EIA-568-A, or EN 50173. Quality and workmanship evaluation shall be solely by the Owner/Designer and designated representatives.

1.5 REGULATORY REQUIREMENTS

A. All work shall conform to the latest issue and addenda of the National Electrical Code, the Building Code, all local codes, standards and ordinances, as applicable.

1. CEC 2019: California Electric Code

2. ANSI/TIA-568-0.D: Generic Telecommunications Cabling for Customer Premises.

3. ANSI/TIA-568-1.D: Commercial Building Telecommunications Cabling Standard.

4. ANSI/TIA-568-2.D: Balanced Twisted Pair Telecommunications Cabling and

Components Standard.

5. ANSI/TIA-568-3.D: Optical Fiber Cabling Components Standard.

6. ANSI/TIA-569-E: Commercial Building Standard for Telecommunications Pathways and Spaces.

7. ANSI/TIA-598-D: Optical Fiber Cable Color Coding.

8. ANSI/TIA-606-C: Administration Standard for Commercial Telecommunications Infrastructures.

9. ANSI/TIA-607-D: Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises.

10. ANSI/TIA/EIA-758-B: Customer-Owned Outside Plant Telecommunication Infrastructure Standard.

11. ANSI/TIA-862-B: Building Automation Systems Cabling Standard.

12. ANSI/TIA/EIA-942-B: Telecommunications Infrastructure Standard for Data Centers.

13. ANSI/TIA-455-C: General requirements for standard test procedures for optical fibers, cables, transducers, sensors, connecting and terminating devices, and other fiber optic components.

14. ANSI/TIA-472C000-B / ICEA S-83-596-2001: Fiber Optic Premises Distribution Cable.

15. ANSI/TIA-472D000-B / ICEA S-87-640-2006: Fiber Optic Outside Plant Communications Cable.

16. ANSI/TIA-472E000 / ICEA S-104-696-2001: Standard For Indoor-Outdoor Optical Fiber Cable.

17. ANSI/TIA-492AAAB-A: Detail Specification for 50um Core Diameter/125um Cladding Diameter Class la Graded-Index Multimode Optical Fibers.

18. ANSI/TIA-492AAAC-B: Detail Specification for 850-nm Laser-Optimized, 50um Cladding Diameter Class la Graded-Index Multimode Optical Fibers.

19. NANSI/TIA-492CAAA: Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers.

20. ANSI/TIA-526-14-C: Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant - OFSTP-14.

21. ANSI/TIA-526-7-A: Measurement of Optical Power Loss of Installed Single-Mode Fiber

Cable Plant - OFSTP-7.

22. ANSI/TIA TSB-140: Additional Guidelines for Field-Testing, Loss and Polarity of Optical Fiber Cabling Systems.

23. ANSI/TIA-604: Fiber Optic Connector Intermateability Standard (FOCIS).

24. IEEE 802.3: Ethernet Standard.

25. BICSI Information Transport Systems Installation Methods Manual.

26. BICSI — Telecommunications Distribution Methods Manual, (TDMM).

27. Underwriters Laboratories (UL) Cable Certification and Follow Up Program.

28. National Electrical Manufacturers Association (NEMA).

29. Institute of Electrical and Electronic Engineers (IEEE).

B. Methodologies outlined in the latest edition of the BICSI Information Transport Systems Installation Methods Manual and BICSI Telecommunications Distribution Methods Manual shall also be used during all installation activities. Should conflicts exist with the foregoing, the authority having jurisdiction for enforcement shall have responsibility for making interpretation on codes related issues.

C. If this document or any of the documents listed in this RFP are in conflict, then the more stringent requirement shall prevail. All documents listed are believed to be the most current releases of the documents. Bidder has the responsibility to determine and adhere to the most recent release when developing the proposal for installation.

D. All fiber optic cabling shall bear OFNP (Plenum Rated), OFNR (Riser Rated) and/or appropriate markings for the environment in which they are installed.

1.6 ABBREVIATIONS

A. The following abbreviations are used in this document:

DC	Direct Current
IDF	Intermediate Distribution Frame
MDF	Main Distribution Frame
PBX	Private Branch Exchange
UTP	Unshielded Twisted Pair

1.7 SUBMITTALS

A. Project Initiation:
   1. Within fourteen (14) days of Notice to Proceed, the data network system installer shall furnish the following in a single consolidated submittal:
      a. Permits: The Contractor shall obtain all required permits and provide copies to the Owner/Architect/Engineer.
      b. Product Literature: Complete manufacturer’s product literature for all

cable, patch panels, cross-connect blocks, cable supports, cable labels, outlet devices, and other products to be used in the installation. In addition, whenever substitutions for recommended products are made, samples (when requested by the Owner/Designer) and the manufacturer's supporting documentation demonstrating compatibility with other related products shall be included. The submittal shall have some type of distinguishing marker or pointer to indicated what specific product is to be provided

c. Construction Schedule: A time-scaled Construction Schedule, using PERT/CPM, indicating general project deadlines and specific dates relating to the installation of the cable distribution system.

d. Testing: Proposed Contractor Category 6A UTP cable test result forms, fiber optic cable test result forms and a list of instrumentation to be used for systems testing.

e. Specification Compliance: A letter shall be provided stating, by section and subsection, that the SCS installer complies with the ENTIRE specification section. If the installer intends to deviate from any portion of the specifications, a detailed explanation of reason in which the installer would like to deviate shall be provided in addition to the specification compliance letter. NO DEVIATIONS SHALL BE ACCEPTABLE UNTIL THEY HAVE BEEN ACCEPTED BY THE PROJECT'S TECHNOLOGY CONSULTANT.

f. Certifications: The contractor shall submit all of the following certifications and the certifications must contain dates which are valid from the date of proposal and not expire any sooner than 12 months after substantial completion of the project.

1) BICSI RCDD Certification: This certification must be held by an on-staff, full-time employee of the SCS installer. The holder must be staffed out of the office that is located within 75 miles of the projected.

2) Proposed Manufacturer's Strategic Partner Certification: This certification have been obtained by the SCS installer's office that is located within 75 miles of the project and shall be a company certification, not and individual certification.

3) Proposed Manufacturer's Installer Certification: This certification must be held by at least 25% of the, on-site, staff and be made available at the site if requested by the owner, architect, and/or project's technology consultant.

4) Fiber Optic Technician Certification: This certification must be held by the on-staff/on-site individual that is supervising the fiber optic installation and performing the fiber optic terminations and testing.

B. Shop Drawings:

1. Submit the following items, for Owner review and approval, within twenty-eight (28) days of notice to proceed:

a. Proposed circuit routing and circuit grouping plan prepared by a BICSI certified RCDD (Registered Communications Distribution Designer). The RCDD certification must be current. Identifiable, separate routing shall be shown for both the station cabling and the MDF-to-IDF tie cabling.

b. In addition to the cable routing, the submitted drawings shall indicate the following, even if the following is expected to be provided by the project's electrical or general contractor:

1) Location of wall penetrations (all penetrations shall be sleeved and contain protective bushings at both ends)

2) Location of sleeved wall pass-thru
3) Size of sleeve at each location installed
4) Quantity of cable passing through each sleeve
5) Location of drops in each room (quantity or labeling of drops are not required in the submittal plans. Labeling shall be provided in the closeout plans and quantities shall be as per the contract documents, addendums, and issued changes. Each drop shall be labeled for the type of outlet that it is)
6) Conduit routing, size, quantity, and stub-up locations for all floor mounted outlets.

c. Drawing Compliance: A letter shall be provided stating that the SCS installer complies with the ENTIRE project drawing, including all general, keyed, and notes to contractor. If the installer intends to deviate from any portion of the specifications, a detailed explanation of reason in which the installer would like to deviate shall be provided in addition to the specification compliance letter. NO DEVIATIONS SHALL BE ACCEPTABLE UNTIL THEY HAVE BEEN ACCEPTED BY THE PROJECT'S TECHNOLOGY CONSULTANT.

d. District Standard Compliance: Contractor shall attach a copy of the Telecommunications Specifications and Installation Standards PDF (English) found at https://www.lodiusd.net/about/projects indicating compliance and adherence to all district standards of telecommunication installation means and methods.

C. Close-out Procedures:

1. Two (2) copies of the following documents shall be delivered to the building owner's representative at the time of system acceptance. The close out submittals shall include:

a. Inspection and Test Reports: During the course of the Project, the Contractor shall maintain an adequate inspection system to ensure that the materials supplied and the work performed, conform to contract requirements. The Contractor shall provide written documentation that indicates that materials acceptance testing was conducted as specified. The Contractor shall also provide documentation, which indicates that all cable termination testing was completed and that all irregularities were corrected prior to job completion.

b. Provide complete test reports for all cabling and devices that comprise system as outlined in this document.

c. Include the Name, address, and telephone of the authorized factory representative with a 24-hour emergency service number.

d. The manual shall also include Manufacturer's data sheets and installation manuals/instructions for all equipment installed, a list of recommended spare parts.

e. Generic or typical owner's instruction and operation manual shall not be acceptable to fulfill this requirement.

f. An up-to-date record ("as-built") set of approved shop drawing prints that have been revised to show each and every change made to the structure cabling system from the original approved shop drawings. Drawings shall consist of a scaled plan of each building showing the placement of each individual item of the technical cabling system equipment as well as raceway size and routing, junction boxes, and conductor size, quantity, and color in each raceway.

g. As-built Drawings shall include locations of cable pathways, access points, card readers, distribution cabinets, intercoms, jacks, NVRs, security cameras, workstations, and MDF/IDF locations. The As-Built drawings

shall be provided using Microsoft Visio. Always use icons from the Visio stencils provided by LUSD. Provide the Owner with electronic versions of the As-Builts on (2) 8GB thumb drives.

1. On As-built Drawings:
    a. Active components between an endpoint and NVR/Swtich must be documented (i.e. power injectors, switches/repeaters, hubs, etc.)
    b. Access control components must have power sources identified.
    c. Jacks must be accompanied by a jack label.
    d. Nodes must be accompanied by an IP address.

h. All drawings must reflect point to point wiring, device address and programmed characteristics as verified in the presence of the engineer and/or the end user unless device addressing is electronically generated, and automatically graphically self-documented by the system.

i. A copy of the manufacturer's warranty on the installed system.

j. Any keys to cabinets and/or equipment and special maintenance tools required to repair, maintain, or service the system.

k. Operating and Maintenance Instructions for all devices within the system. These instructions shall reflect any changes made during the course of construction, and shall be provided to the Owner, for their use, in a three-ring binder labeled with the project name and description. (4 copies)

l. Upon completion of the work and at a time designated by the Architect or owner, provide formal training sessions for the Owner's operating personnel to include location, operation, and maintenance of all included systems and equipment. Minimum amount of training time shall be at least 4 hours.

m. One (1) 30" x 42" laminated floor plan sheets illustrating technology drops and cable designation. Contractor shall provide one complete floor plan sheet for each telecommunications room (MDF or IDF)

PART 2 - PRODUCTS

2.1 GENERAL

A. Installation: The cabling shall be installed per requirements of the manufacturer and the Project Documents utilizing materials meeting all applicable TIA/EIA standards and School District standards. The Contractor is responsible for providing all incidental and/or miscellaneous hardware not explicitly specified below as required for a complete and operational system.

B. Materials: Materials shall be as listed or shall be approved equivalent products of other manufacturers meeting the intent and quality level of the TIA/EIA specifications. All approved equivalent products will be published by addendum ten days prior to proposal for Architect/Engineer to review.

C. Testing: All installed cabling shall be tested 100% good after installation by the Contractor. All final test results shall be delivered to owner at completion of project. Refer to closeout requirements listed under section 1.5.

D. Ratings: All products shall be new and brought to the job site in the original manufacturer's packaging. Electrical components (including innerduct) shall bear the Underwriter's Laboratories label. All communications cable shall bear flammability testing ratings as follows:
CM Communications Cable

CMP Plenum Rated Communications Cable
CMR Riser-Rated Communications Cable

E. Initial Cable Inspection: The Contractor shall inspect all cable prior to installation to verify that it is identified properly on the reel identification label, that it is of the proper gauge, containing the correct number of pairs, etc. Note any buckling of the jacket that would indicate possible problems. Damaged cable or any other components failing to meet specifications shall not be used in the installation.

F. Cable Lubricants: Lubricants specifically designed for installing communications cable may be used to reduce pulling tension as necessary when pulling cable into conduit.
1. Approved Products
a. Twisted-pair cable: Dyna-Blue
American Polywater

G. Fire Wall Sealant: Any penetration through firewalls (including those in sleeves) will be resealed with an Underwriter Laboratories (UL) approved sealant.
1. Approved Products
a. 3M or
b. Pre-approved equal

H. All Category 6A patch cables and jacks on the entire project provided shall be colored for:
1. Blue VOIP
2. Black Voice Drops
3. White Access Point/ Wi-Fi
4. Green Intercom
5. Electric-Ivory Data
6. Yellow Access Control
7. Areas:
a. Data Closet Category 6A patch cables (2.2 E.)
b. Station Wiring (2.5 A.)
c. Flush Mount Jacks (2.6 A.)
d. Workstation Category 6A Patch Cables (2.6 C.)

2.2 DATA CLOSET (MDF/IDF) CATEGORY 6A TERMINATION HARDWARE

A. Equipment Racks/Cabinets:
1. All locations that require Two post rack shall use – Chatsworth 66353-703
2. All locations that require four-post racks shall use – Middle Atlantic #SR-40-28
a. Approved Accessory Products:
1) QFAN – Middle Atlantic Accessory Quiet fan for cabinet
2) Lace-44LP – Middle Atlantic Vertical Lacing Bar
3) DPFP1 - 1U Rack Filler Panel.
3. For all locations, the contractor shall Provide and install a Panduit cable manager in-between every patch panel. Contractor must use one wire management panel for every patch panel.
a. Approved Products:
1) WMPSE - 1U Dual-Sided Horizontal Wire Management
2) WMPH2E - 2U Dual-Sided Horizontal Wire Management
3) WMPFSE - 1U Single-Sided Horizontal Wire Management
4) WMPF1E - 2U Single-Sided Horizontal Wire Management
5) WMPV45E - Dual-Sided Vertical Wire Management
4. Provide 3/4" fire-treated plywood backing on all walls. When installed in a classroom, the plywood dimension shall be no larger than the cabinet/IDF. All plywood backboard shall be fastened to (2) separate wall studs by 4 lag bolts.

B. Distribution Rack Grounding

All Racks shall be grounded using stranded #6 AWG insulated copper conductor. Connect to service entrance grounding electrode. Provide all required bonding materials and hardware and bond to building grounding electrode subsystem at building electrical service entrance.

1. For all MDFs, Telecommunications Main Grounding Busbar (TMGB) shall be constructed of .25" (6.4 mm) thick solid copper bar. The busbar shall be 4" (100 mm) high and 20" (510 mm) long and shall have 30 attachment points (two rows of 15 each) for two-hole grounding lugs. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 27 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4) mm) hole centers. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall. The busbar shall be UL Listed as grounding and bonding equipment.
2. For all IDFs, Telecommunications Grounding Busbar (TGB) shall be constructed of .25" (6.4 mm) thick solid copper bar. The busbar shall be 2" (50 mm) high and 12" (300 mm) long and shall have 9 attachment points (one row) for two-hole grounding lugs. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 6 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall. The busbar shall be UL Listed as grounding and bonding equipment.
    a. Approved Products:
        1) RGW-100-1Y – Panduit Paint-piercing grounding washer kit
        2) RGS134-1Y – Panduit Rack Grounding Strip Kit
        3) RGEJ624PHY – Panduit Equipment Jumper Grounding Kit, 24" jumpers

C. Fiber Optic Patch Panels

Provide (4) duplex fiber patch cords for each run installed. Verify Connection types with the owner prior to purchase

- a. Fiber Adapter Panel
    - 1) Panduit #FAP3WAQDSCZ - OM4 SC FAP loaded with 3 SC duplex multimode couplers (aqua)
    - 2) Panduit FAP3WBUDSCZ - OS2 SC FAP loaded with 3 SC duplex singlemode couplers (blue)
- b. Fiber Enclosures
    1. Panduit #FRME1U for 1RU enclosures
    2. Panduit #FRME2U for 2RU enclosures
    3. Panduit #FRME3 for 3RU enclosures
    4. Panduit #FRME4 for 4RU enclosures

The enclosures used shall provide termination panels for LC type connectors and be of sufficient size and capacity to terminate 110% of the fiber count of the inside of outside fiber optic cables. Patch panels must be 19" rack mountable. Provide all termination accessories, fiber patch cords, enclosures and test for a complete fiber optic distribution system.

D. Modular Patch Panels: The Category 6 data station cable shall be terminated on a modular patch panel with rear mounted termination hardware. Patch panels shall be 19-inch rack mountable. Workstation patch panels shall terminate all workstation

communications outlets. Furnish units that adhere to the performance requirements TIA/EIA-568A standards.

1. Approved Products:
   a. Patch Panels
      1) Panduit 24 Port #CPP24FMWBLY Mini-Com Flush Mount Modular Patch Panels
      2) Panduit 48 Port #CPP48FMWBLY Mini-Com Flush Mount Modular Patch Panels
   b. Provide cable support bars at the back of all patch panels to provide additional support at rear of rack and panels.
   c. Provide category 6 Jack Modules to terminate 110% of the total cable to each communications closet.
      1) Panduit #CJ688TGBL Mini-Com UTP RJ45 Cat6 TG Jack Module, Black

E. Power Strip: A power strip shall be installed horizontally at the back of each data rack.
1. Approved Products
   a. Chatsworth Products, Inc. (CPI) #12816-702

F. Cable Management Panels: Provide cable management panels as required for horizontal and vertical cable management. Provide vertical wire management on ends and in between all racks on entire project.
1. Approved Products
   a. Horizontal – Panduit NCMHF2 (3”) (Provide 1 below each fiber optic enclosure)

   b. Vertical – Panduit PRV6 with PRD6 double hinge doors on the ends of each rack, and Panduit PRV8 with PRD8 double hinge doors in between racks.

G. Network Rack Patch Cables: Cabling Contractor shall provide owner with one (1) Category 6 patch cable for each data drop on entire project. These cables will provide connectivity from the front of the network patch panels to the network equipment provided by owner upon move-in. The patch cables are to be terminated properly with RJ-45 connections on each end with the proper pin-out assignments per project configuration.

1. Approved Products: **All patch cords shall be manufactured by Panduit.**
   a. Headend patch cable colors shall be:
      1) Blue VOIP
      2) Black Voice Drops
      3) White Access Point/ Wi-Fi
      4) Green Intercom
      5) Electric-Ivory Data
      6) Yellow Access Control
   b. Contractor to provide patch cables for each system as indicated above.
   c. Provide 3ft patch cables for MDF / IDF racks 100%
      1) Approved Products:
         1) CP24BL - Panduit 24 Port Mini-Com patch panel
         2) CP48BLY - Panduit 48 Port Mini-Com patch panel (Metal panel)
         3) CPPL24WBLY - Panduit 24 Port Mini-Com modular patch panel (Plastic)
         4) FP6X88MTG - Panduit TX6A™ Category 6A UTP Field-Term RJ45 Plug
         5) CJ6X88TGIG - Panduit GRAY CAT6A MOD JACK (for

Server Locations)
6) CJ6X88TGYL - Panduit Yellow 6A Mini-Com Jack (Access Control)
7) CJ6X88TGWH - Panduit White 6A Mini-Com Jack (Ceiling WAPs)
8) CJ6X88TGBU - Panduit Blue Cat 6A Mini Com Jack (for VoIP)
9) CJ6X88TGGR - Panduit Green Cat 6A Mini Com Jack (for Intercom)
10) CJ6X88TGEI - Panduit Electric Ivory Cat 6A Mini Com Jack
11) FPUD6X88MTG - Panduit Up/Down Field Term Plug (for Intercom Horn/Speaker Weather Tight Bell Boxes Only; terminate using down orientation diagram)
12) FP6X88MTG - Panduit Field Term Plug for Camera locations
13) UTP6XXYL - Panduit Non-Shielded Yellow 6A Patch Cord, XX is length
14) UTP28X*YL - Panduit Cat.6A, 28AWG, Yellow, * = length: 1,3,5,7,19,14 feet
15) P110B100R4WJY - Panduit 19" Rack Mount Panel w 2 100pr 110 punch-down blocks and jumper troughs
16) P110B100R2Y - Panduit 2U Pan-Punch Rack Mount Panel with 2 100-Pair pre-mounted bases
17) P110CB4-XY - Panduit 4pr 110 Connecting Clips 10pk
18) P110CB5-XY - Panduit 5pr 110 Connecting Clips 10pk
19) 7133825 - General Cable Purple CAT 6A CMR (for Data at workstations)
20) 7133819 - General Cable Blue CAT 6A CMR (for WAPs)
21) 7131823 - General Cable Green CAT 6A CMP (for Intercom drops, closets)
22) 7131822 - General Cable Yellow CAT 6A CMP (for Cameras, Closets)
23) 7133821 - General Cable Gray CAT 6A CMR 4 Pair wire (for Voice)
24) CM-00424SMX-CF6A-02 - Commscope SystiMax, Black CAT 6A OSP (Voice and Data)
25) 2131550E - General Cable Cat.5e, 25 pair CMP, White
26) 2133269E - General Cable Cat.5e, 25 pair CMP, Gray
27) 04-097-31 - Superior Essex CAT 5 25 Pair OSP

H. Ladder Rack Assembly
1. Approved Products: All ladder rack equipment will be manufactured by Chatsworth Products Inc. Use as needed.
a. 12” Ladder Rack
1) CPI – 10250-112
2) CPI – 10250-718
b. Butt-Splice Kit
1) CPI – 11301-701
c. Junction-Splice Kit
1) CPI - 11302-701
d. 6” Channel Rack-To-Runway Mounting Plate
1) CPI – 12121-712
e. Cable Runway Elevation Kit
1) CPI – 10506-706
2) CPI – 10506-712
f. Wall Angle Support Kit
1) CPI – 11421-712

1.

I. Rack/Cabinet Electrical:

1. A power distribution strip shall be installed vertically at the back of each data rack and/or cabinet.
   a. Approved Products
      1) Standard Outlet Chatsworth Products, Inc. (CPI) 12851-706
      2) Twist Lock Outlet Chatsworth Products, Inc. (CPI) 12851-707
2. Provide District-Approved electrical UPS equipment at each MDF and IDF as required for full functionality and a minimum of 20 minute uptime in case of power interruption.

2.3 CABLE TRAY

A. Cable tray shall be used to route all cabling in major hallways and corridors. The cable tray shall be a two tiered system with Fiber on the top and all copper cabling on the bottom. Cable tray shall consist of a minimum 2” deep steel wire mesh tray with all necessary cable drop outs, bend radius protection, connectors and all other components to create a fully functional cable tray system that will not threaten the structural integrity of the cable jacket. All threaded rods supporting the tray will be covered with a plastic sleeve to protect the cable jacket.

B. Approved manufacturers:
   1. Panduit
   2. Owner approved manufacturer.

2.4 LADDER RACKS

A. Ladder Racks shall be used in all MDF/IDF rooms. Ladder Rack shall be 12” wide and 2” deep, minimum. Approved manufacturers:
   1. Panduit
   2. Chatsworth
   3. Owner approved manufacturer.

2.6 CABLE ROUTING/PATHWAY

A. Cable Support System: All low voltage cabling shall be installed and supported using a modular cable support system at 48” intervals unless installed in conduit. Do not exceed manufacture recommendation for the quantity of cables supported in an individual support.

B. All cable bundles shall be grouped together using plenum rated Velcro for the entire run above and below the ceilings, and through cable chases in center of classrooms, chases down vertical corner of classrooms, and transition through/to crawlspaces.

C. Innerduct shall be bright orange and shall be labeled fiber optic cables from fiber patch panel to conduit or plenum entrances. Innerduct installed in plenum rated ceilings shall be plenum rated.

D. Raceway shall be utilized for all down-wall cable routes in reconstructed areas indicated on drawings

1. Approved products
   a. LD-5 – Panduit Raceway for Data/Wi-Fi/Access Control System
   b. LDP-10 – Panduit Raceway for Data/Voice/Coax

c. T-70 – Panduit Raceway for Computer Lab that will accept communications and power
d. CMBEI-X – Panduit Mini-Com Blank Ivory
e. CFPSL4EIY – Panduit Classic Executive Faceplate, Sloped (anti-shear)
f. JBX3510EI-A – Panduit Single gang Junction box
g. Chatsworth Products Inc. (CPI)
h. Owner-Approved product

2.7 FIBER OPTIC PRODUCTS

A. IDF/MDF Intra Building Cabling, Approved Products:
a. Fiber Backbone Cabling
2. BL0061PNU – General Cable OM4 6F 50um MM TB OFNP
3. AP0061PNU – General Cable OS2 6F SM TB OFNP
4. BL0061PNU – General Cable OM4 6F 50um MM TB OFNP
5. BL0061ANU.BK – General Cable OM4 6F 50um MM TB OFNP I/O
1. AP0061ANU.BK – General Cable OS2 6F SM TB OFNP I/O
2. BL0064M1A-DWB – General Cable OM4 6F 50um MM LT SINGLE JKT
3. AQ0064M1A-DWB – General Cable OS2 6F SM LT SINGLE JKT

2.8 STATION WIRING

A. Wire: The data and voice wire provided for all outlets shall be (Category 6A) Plenum-Rated unshielded twisted pair, four-pair, 24 AWG solid copper conductor, meeting the intent and quality level of the TIA/EIA-568-A Commercial Building Wiring Standard. Refer to floor plan and data outlet legend for number of active data ports to specified faceplates.
1. Approved Products: For all voice and data connections: Panduit CS44P

B. Testing: The Category 6A four-pair UTP cable must be UL Performance Level tested. Each 1000-foot spool must be individually tested with test results affixed to the spool. All cable must be provided on new 1000-foot spools. NO “SHORTS” WILL BE ALLOWED. IF SHORTS ARE DISCOVERED, THE CONTRACTOR WILL BE REQUIRED TO UNINSTALL ALL CABLE ON THE ENTIRE PROJECT AND INSTALL NEW CABLE AT NO ADDITIONAL COST TO THE OWNER.

C. Rating: Cable installed in conduit shall be non-plenum rated. Cable not installed in conduit shall be plenum rated if installed in plenum ceiling space, non plenum rated otherwise.

D. Provide 10 feet service loop at all headend locations properly supported above ceiling. Provide 3’ service loop at each workstation outlet properly supported above ceiling. All workstation service loops shall be made in figure eight configurations, no exceptions.

E. All cable shall be bundled with Velcro from patch panel to outlet. Velcro shall be rated for plenum space.

2.9 STATION HARDWARE

A. Flush Mount Jacks: Flush mount jacks shall be high quality Category 6A RJ45 modular jacks with circuit board construction and IDC style or 110-style wire, T568B terminations. Jacks shall meet EIA/TIA TSB40 recommendations for Category 6A connecting hardware.
1. Approved Products – Data and Voice Jacks: Panduit LDP-10

2. Blank inserts shall be required in unused keystone ports for all faceplates.

B. Faceplates: Faceplates shall be a 4-port, flush mounted (unless otherwise specified for device by district), Panduit Executive Style faceplate with Label Pocket, for RJ45 outlets at all locations.
Approved Products:
1. 4-Port Single Gang, Panduit # CFPE4EIY or other port-count Panduit Executive Style equivalent.
2. Provide wall mounted handset faceplates where applicable for wall mounted phone. Refer to floor plan for locations. Panduit #KWPK6
3. Provide Mounting Straps (where applicable)

C. Workstation Patch Cables: Cabling Contractor shall provide district with (1) – 3 Meter Category 6A patch cable for each data drop on entire project. Each cable will be terminated properly with RJ45 connections on each end with appropriate pin-out assignments per project configuration.

PART 3 - EXECUTION

3.1 GENERAL

A. Fire Wall Penetrations: The contractor shall avoid penetration of fire-rated walls and floors wherever possible. Where penetrations are necessary, they shall be sleeved with metallic conduit and resealed with an Underwriter Laboratories (UL) approved sealant. Contractor shall also seal all floor, ceiling and wall penetrations in fire or smoke barriers and in the wiring closet.

B. Allowable Cable Bend Radius and Pull Tension: In general, communications cable cannot tolerate sharp bends or excessive pull tension during installation. Refer to the cable manufacturers allowable bend radius and pull tension data for the maximum allowable limits.

C. Cable Lubricants: After installation, exposed cable and other surfaces must be cleaned free of lubricant residue.

D. Pull Strings: Provide pull strings in all new conduits, including all conduits with cable installed as part of this contract. Pull test is not to exceed 200 pounds. Data and video cables can be pulled together with pull strings.

E. Conduit Fill: Conduit fill shall not exceed 40%.

F. Damage:
1. The Contractor shall replace or rework cables showing evidence of improper handling including stretches, kinks, short radius bends, over-tightened bindings, loosely twisted and over-twisted pairs at terminals and cable sheath removed too far (over 1-1/2 inches).
2. The Contractor shall replace any damaged ceiling tiles that are broken during cable installation.

G. Clean Up:
All clean up activity related to work performed will be the responsibility of the Contractor and must be completed daily before leaving the facility.

3.2 DOCUMENTATION

A. Labels

The Contractor shall follow the “LUSD Labeling Format” specified in below graph, with the exception of workstation cables (i.e., patch cords). Labels shall never be hand-written and shall be machine printed on clear or opaque tape, stenciled onto adhesive labels, or typewritten onto adhesive labels. The font shall be at least one-eighth inch (1/8”) in height, block characters, and legible. Text color shall contrast with the label background for easy readability; if labeling tape is utilized, the font color shall contrast with the tape background. Patch panels shall exhibit workstation numbers in sequential order for all workstations served by the MDF or IDF. Labeling shall be completed before testing commences, and any discrepancies found during inspection will void all test results.

The LUSD labeling format is a 4-part identifier that indicates the campus, type of jack, IDF location, room, and jack. Below is a key to determine the jack information and name new locations.			
WW-XX-YY-ZZ			
WW – Campus and voice or Data	**XX** - MDF or IDF Designation	**YY** – Room # or Abbreviation	**ZZ** – Jack # (Two Digits)
Data = Even # (Purple) Voice = Odd # (Grey) Video = C (Coax) Card Readers = CR Camera = VS NVR = NVR	MDF = A IDF-B = B IDF-C = C etc.	West Admin Office = WA East Admin Office = EA Library = Lib 15 = 15 M2 = M2 10 = 10 etc. Determined by Campus Architect or IT Staff.	01 (1st Jack in Room) 02 (2nd Jack in Room) 03 (3rd Jack in Room) etc. Starts in corner of room and counts clockwise. New jacks increase from last jack.

Davis ES Data Number Shall be 38 and Voice shall be 37

e.g.

VOICE EXAMPLE: The first voice jack in room M1 for IDF “G” = "37-G-M1-01"

DATA EXAMPLE: DATA EXAMPLE: The first data jack in room E1 for IDF “F” = "38-F-E1-01"

Other Examples:

CARD READER EXAMPLE: IDF Alpha ID + "CR" + IP address node # = DCR101

SURVEILLANCE CAMERA EXAMPLE: IDF Alpha ID + "VS" + IP address node # = BVS101

NVR SECURITY EXAMPLE: IDF Alpha ID + "NVR" + IP address node # = ANVR101

I. *Dashes do not need to be included. However, the jack number must be two numeric characters. For example: “10GM201” instead of “10GM21”

II. MDF/IDF'S & WORKSTATIONS ALL JACKS ARE TO BE IDENTIFIED WITH THE APPROPRIATE NUMBERING SCHEME

Data Jack Matrix				
Site	Floor	IDF	Zone	Jack#
01 (Phone)	1	A	01	01
02 (Data	2	B	02	02
	3	C	03	03
		D	04	04
		E	05	05

Wireless Jack Matrix				
Site	Floor	IDF	Zone	Jack#
02 (Data)	1	A	01	W1
	2	B	02	W2
	3	C	03	W3
		D	04	W4
		E	05	W5

Note New VoIP jacks are 02, not 01
Only old phone jacks are 01

All numbers must be legibly written on the jacks (or 110 punch panels, etc.) with a black permanent marker and then labeled.

B. Patch Panel Labeling

Patch panels shall be labeled to reflect workstation numbers in a sequential order, corresponding to all workstations served by the MDF or IDF, as specified in the “LUSD Labeling Format.”

1. All fiber strands shall be terminated and labeled at both ends with its respective IDF identifier.

C. Testing and Compliance

Labeling shall be finalized prior to the start of testing. Any discrepancies identified during inspection will invalidate all test results.

3.3 EQUIPMENT RACK CONFIGURATION

A. Equipment Racks: Equipment racks shall be assembled and mounted in locations shown on the Drawings and as detailed. Each rack shall be securely mounted to the floor and braced to the wall with cable tray in accordance with the manufacturer’s instructions and recommendations. Racks shall be mounted such that the side rails are plumb with vertical cable management panels. Racks to be located such that future expansion can occur without relocating existing racks. Racks shall be grounded in accordance with NEC requirements.

B. Wire Management Components: Horizontal cable management panels shall be installed directly above and below each patch panel, also 1 per patch panel should be left at site to accommodate the switch gear when they are installed. Vertical cable management panels shall be installed on each side of the rack. In instances where more than one rack is installed in a single location, vertical cable management shall be installed between the racks and on either side.

C. Cable Placement: Cable installation in the Wiring Closet must conform to the Project

Drawings. All cabling shall be routed so as to avoid interference with any other service or system, operation, or maintenance location. Avoid crossing area horizontally just above or below any riser conduit. Lay and dress cables to allow other cables to enter the conduit/riser without difficulty at a later time by maintaining a working distance from these openings.

D. Cable Routing: Cable shall be routed as close as possible to the ceiling, floor, or corners to ensure that adequate wall or backboard space is available for current and future equipment. All cable runs within the Wiring Closet shall be horizontal or vertical within the constraints of minimum cable bending radii. Minimum bend radius shall be observed. Cables shall not be tie-wrapped to electrical conduit or other equipment.

E. Installation: All incoming cables shall be routed on the cable tray and neatly dressed down to the patch panels.

F. Hardware: Provide rack and jack panel hardware as required for all data station wiring.

3.4 STATION WIRING INSTALLATION

A. General:
1. Cabling between wiring closet and workstation locations shall be made as individual home runs. No intermediate punch down blocks or splices may be installed or utilized between the wiring closet and the communications outlet at the workstation location.
2. All cable must be handled with care during installation so as not to change performance specifications. Factory twists of each individual pair must be maintained up to the connection points at both ends of the cable. There shall never be more than one and one-half inches of unsheathed enhanced Category 6A UTP cable at either the wiring closet or the workstation termination locations.

B. Exposed Cable:
1. All cabling shall be installed inside walls or ceiling spaces whenever possible. Exposed station cable will only be run where indicated on the Drawings.
2. Additional exposed cable runs will require Owner approval and will only be allowed when no other options exist.

C. Placement: All cabling and associated hardware shall be placed so as to make efficient use of available space. All cabling and associated hardware shall be placed so as not to impair the Owner’s efficient use of their full capacity.

D. Cable Routes:
1. All cabling placed in ceiling areas must be in conduit, cable tray or J-Hooks. Cable supports shall be permanently anchored to building structure or substrates. Provide attachment hardware and anchors designed for the structure to which attached and that are suitably sized to carry the weight of the cables to be supported. Do not route cable through webbing of structural steel. Cabling must be supported in dedicated supports intended to support cabling as described in this section.
2. Attaching cable to pipes or other mechanical items is not permitted. Use J-Hooks for up to 15 cables (Chatsworth hooks with appropriate brackets). All runs of sixteen (16) or more cables, provide cable rings on 36-inch maximum centers to hang cable. Communications cable shall be rerouted so as to provide a minimum of 18 inches spacing from light fixtures, sources of heat, power feeder conduits and EMI sources. Cabling shall not be attached to ceiling. Grid support wires. Cable runs shall be parallel or perpendicular to building structure. Multiple cables to be bundled together every 6 feet.

3.5 STATION HARDWARE

A. Flush Mount Jacks: Flush mount jacks shall be mounted in a faceplate with backbox.

B. Placement: Where possible, the communications outlet shall be located so that its centerline is 18 inches above floor level or 12 inches above permanent bench surfaces. Outlets shall not be mounted on temporary, movable, or removable surfaces, doors, or access hatches.

C. RJ-45 Jack Pin Assignments:
   1. Pin connections for data station cable outlets and patch panels shall match EIA/TIA 568 modular jack wiring recommendation T568B.
   2. Pin connections at data jack panels shall match pin connections at outlets (straight through wiring).

3.6 CABLE TESTING REQUIREMENTS

A. Notification: The Owner and Engineer shall be notified one week prior to any testing so that the testing may be witnessed.

B. Inspection: Before requesting a final inspection, the Contractor shall perform a series of end-to-end installation performance tests. The Contractor shall submit for approval a proposal describing the test procedures, test result forms and timetable for all copper and fiber optic cabling.

C. Procedures: Trained personnel shall perform all testing. Acceptance of the test procedures discussed below is predicated on the Contractor's use of the recommended products and adherence to the inspection requirements and practices set forth. Acceptance of the completed installation will be evaluated in the context of each of these factors.

D. Errors: When errors are found, the source of each shall be determined, corrected and the cable retested. All defective components shall be replaced and retested. Re-test results must be provided on Owner approved forms and witnessed by Owner.

E. Twisted Pair Cable Testing:
   1. At a minimum, the Contractor shall test all station drop cable pairs from Data Closet termination patch panels to outlet device RJ45 jacks. Category 6A products shall be tested for compliance to ANSI/TIA/EIA 568A and ISO/IES 11801 for a Category 6A rated installation. Test equipment used shall meet TIA/EIA TSB-67, Level II accuracy. Further, the contractor shall have a copy of TSB-67 in their possession and be familiar with its contents.
   2. Each wire/pair shall be tested at both ends for the following:
      a. Wire map (pin to pin connectivity)
      b. Length (in feet)
      c. Attenuation
      d. Near end cross talk (NEXT)
      e. Power Sum
   3. Test equipment shall provide an electronic and printed record of these tests.
   4. Test results for each Category 6A four-pair UTP cable must be submitted with identification to match labels on all patch panel ports and RJ45 jacks and must match as-builts associated with that cable.

F. Fiber Optic Cable Testing

1. Testing device for fiber optic cables shall be a high quality OTDR (Optical Time-Domain Reflectometer) equipped with a printer. The printed data shall show, in addition to any summary information, the complete test trace and all relevant scale settings. The OTDR must have the capability to take measurements from bare fiber strands as well as SC connector terminations.

2. All fiber optic cable shall be tested on the reel before installation to insure that it meets the specifications outlined herein.

3. After installation the Contractor shall test each fiber strand in accordance the EIA 455-171 Method D procedures (bi-directional testing) at both 850nm and 1300nm for multimode or 1310nm and 1550nm for singlemode. A form shall be completed for each cable showing data recorded for each strand including length, total segment (end-to-end) loss (dB) and connector losses (dB) at each end. In addition, the printed data strip for each strand shall be attached to the form. Patch cables shall also be tested.

4. Acceptable fiber optic connector loss shall not exceed .75dB per mated pair. The Contractor is responsible for obtaining minimum loss in fiber connections and polishing per manufacturer specifications.

5. Singlemode:
   a. Singlemode fibers shall have a maximum attenuation of 1.0 dB/km at 1310 nm and 1.0 dB/km at 1550 nm.

6. Multimode:
   a. 50/125um micron multimode fibers shall have a maximum attenuation of 3.5 dB/km at 850 nm and 1.5 dB/km at 1300 nm. Minimum bandwidth shall be 2000 MHz/km at 850 nm and 500 MHz/km at 1300 nm.

7. **OTDR shots shall be provided for each strand of fiber optics completely installed and terminated.**

3.7 INSPECTION

A. Conformance to the installation practices covered above are to be verified when completed. In some cases, the Owner/Designer may inspect before acceptance.
   1. Written Test Report:
      a. Complete test results, including actual values associated with tests.
      b. Show all certifications for telecommunications wiring systems.
      c. Include cable maps showing each cable route and keyed to cable labels. Provide owner with complete floor plans identifying outlet location and cable routing drawing in AutoCad format. Provide electronic copy of drawings to owner in AutoCad version 14 or greater.
      d. Documentation of outlet, cable, and rack labeling system.

B. After performing all tests, tabulate results and bind together in format acceptable to Owner. Installer shall provide written certification in the test report that telecommunications cable is properly installed and test results certify system to all specified standards.

END OF SECTION 27 10 00

SECTION 27 41 16 - INTEGRATED CLASSROOM AUDIO-VIDEO SYSTEMS AND EQUIPMENT

CONDITIONS OF THE CONTRACT AND DIVISION 1, as applicable, apply to this Section.

PART 1 - GENERAL

1.1 RELATED WORK

A. All Division 26 at it relates to this scope of work.
B. Section 27 00 00
C. Section 27 10 00
D. Section 27 31 00

1.2 DESCRIPTION

A. Summary of Work:
   1. Provide a complete and tested classroom presentation system. The presentation system shall include, but not be limited to the following:
      a. Contractor shall provide and install all audiovisual faceplates, transmission media infrastructure, and a patch cables required to connect each presentation device to the associate input device
      b. Proposing contractor must coordinate with project construction schedule and existing technology system contractor to provide complete turn-key solution to owner.
   2. The installation shall comply with all applicable codes and standards in effect at the job site and as indicated in the Drawings and Specifications.
   3. Reference project drawings for locations, quantities, and coordination with other trades.
   4. Comply with all applicable construction standards listed out on Lodi USD website at https://www.lodiusd.net/about/projects with direct reference to the Telecommunications Specifications and Installation Standards.

1.3 QUALITY ASSURANCE

A. Contractors who do not currently possess the necessary qualifications, trained and experienced personnel, financial capacity, and meet the other requirements herein describe will be disqualified.

B. The Contractor, as a business entity, shall be an authorized distributor and designated representative of the equipment manufacturer, with full warranty privileges. The proposed contractor shall have been actively engaged in the business of selling, installing, and servicing commercial building commercial communication systems for a period of at least 5 years.

C. Recently formed companies are acceptable only if specific pre-approval is requested, and granted by the Architect/Engineer, based on experience of key personnel, current and completed projects, and all licensing requirements are met 10 working days prior to the contract proposal date.

D. The Contractor shall have an office within 150-miles of the job site, staffed with trained technicians who are qualified and licensed to supervise the installation, to be responsible that the system is installed as submitted, to conduct system start up and perform a 100 percent operational audit of all installed devices, to instruct the Owners representatives in the proper operation of the system, and to provide service throughout the warranty period. The contractor shall be capable of dispatching technicians to repair a system within six hours of a service request.

E. The Contractor shall be fully experienced in the design and installation of the type of system herein specified, and shall furnish with the contract proposal an itemized list of the installations of the type specified herein. The list shall include the name of the project, date of completion, the amount of the contract, the name, and telephone number of a qualified person to contact for reference. This list must contain at least two (2) projects within a 150- mile radius of the school district to allow school administration officials to visit the job site for review of the system installation and service. Each reference project listed must utilize equipment by the same manufacturer as the proposed system.

F. The Contractor shall employ factory-trained technicians capable of supporting the maintenance of the system. No contract employees are allowed unless they have been to the factory service school within the last 18 months. A certificate of this training shall be provided with the contractors' submittal.

G. The Contractor shall not have any grievances or complaints of record regarding workmanship, code compliance, or service response. A Proposed Contractor that has any prior finding(s) of a code violation or has any litigation in process concerning the installation of a communication system is unacceptable.

H. Any discrepancy in quantity or part numbers between the drawings and the bid specifications shall be brought to the attention of the Consultant for clarification during the bidding period. No allowance shall be made to the Contractor by reason of failure to have brought said discrepancies to the attention of the Consultant prior to award of contract.

I. The Contractor shall provide all necessary patch cables, riser/plenum cabling and connectors interconnecting all equipment and all required A/V and network equipment to provide for fully functional systems. In addition, all cabling raceway, support systems, sleeves and any other materials required to properly install and support cabling systems.

J. The ability of the Contractor to obtain plans and provide a performance bond shall not be regarded as the sole qualification of the Contractors' competency and responsibility to meet the requirements and obligations of the contract.

K. The Builder shall be satisfied that a proposed Contractor meets all the requirements expressed herein before including the Contractor's proposal in the project.

L. The Owner may investigate, as they deem necessary to determine the ability of the proposed Contractor to perform the work. The proposed Contractor shall furnish to the Owner with any information or data requested for this purpose.

M. The Owner reserves the right to reject any contract proposal if the evidence submitted, or their investigation, fails to indicate that the Contractor is qualified to fulfill of any part of the contract or to complete the work contemplated therein.

N. The Owner reserves the right to reject the proposal of any Contractor who has previously failed to perform properly, or complete on time, contracts of a similar nature.

O. Pre-Construction Meeting:

1. The successful Contractor shall attend mandatory pre-construction meetings with individuals deemed necessary by the Owner's representative prior to the start of the work.
2. The contractor shall provide a mock-up of the complete classroom projector system to include all products listed in Part 2 of this specification.
3. All proposing contractors must have ability to demonstrate a/v system being proposed and provide owner with completely installed system to evaluate

performance and operation.

P. Acceptance:

1. The Owner's representative reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

1.4 REGULATORY REQUIREMENTS

A. Standards: All work shall be performed in accordance with the latest revisions of the following standards and codes:
1. Latest Local Codes and Amendments
2. 2015 National Electrical Code

B. Other References:
1. TIA/EIA-568-A Commercial Building Telecommunications Wiring Standard
2. EIA/TIA-569 Commercial Building Standard for Telecommunication Pathways and Spaces.
3. TIA/EIA-606 The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
4. TIA/EIA-607 Commercial Building Grounding and Bonding Requirements for Telecommunications.
5. EIA/TIA 455-A Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices and Other Fiber Optic Components.
6. TIA/EIA TSB 67 Transmission Performance Specification for Field Testing of Unshielded Twisted-Pair Cabling Systems.
7. TIA/EIA TSB 72 Centralized Optical Fiber Cabling Guidelines
8. ISO/IEC 1180 Generic Cabling Standard
9. EN 50173 Generic Cabling Standards for Customer Premises
10. ANSI/EIA/TIA 526-14 Optical Power Loss Measurements of Installed Multimode Fiber Cable Plan.

C. Governing Codes and Conflicts:
1. If the requirements of these specifications or the Project Drawings exceed those of the governing codes and regulations, then the requirements of these specifications and the Drawings shall govern. However, nothing in the Drawings or Specifications shall be construed to permit work not conforming to all governing codes and regulations.

1.5 ABBREVIATIONS

A. The following abbreviations are used in this document:
AV Audio-Visual Output Plate mounted behind OFCI Promethean Interactive Display.
PS Input plate or presentation station for teaching station connection to OFCI Promethean Interactive Display

1.6 SUBMITTALS

A. Project Initiation:
1. Within fourteen (14) days of Notice to Proceed, the data network system installer shall furnish the following in a single consolidated submittal:
a. Permits: The Contractor shall obtain all required permits and provide copies to the Owner/Architect/Engineer.
b. Product Literature: Complete manufacturer's product literature for all

cable, patch panels, cross-connect blocks, cable supports, cable labels, outlet devices, and other products to be used in the installation. In addition, whenever substitutions for recommended products are made, samples (when requested by the Owner/Designer) and the manufacturer's supporting documentation demonstrating compatibility with other related products shall be included. The submittal shall have some type of distinguishing marker or pointer to indicated what specific product is to be provided

c. **Product Bill of Materials that includes make, model and quantity of all equipment and materials being provided by the contractor.**

d. Construction Schedule: A time-scaled Construction Schedule, using PERT/CPM, indicating general project deadlines and specific dates relating to the installation of the cable distribution system.

e. Specification Compliance: A letter shall be provided stating, by section and subsection, that the Audio-Video installer complies with the ENTIRE specification section. If the installer intends to deviate from any portion of the specifications, a detailed explanation of reason in which the installer would like to deviate shall be provided in addition to the specification compliance letter. NO DEVIATIONS SHALL BE ACCEPTABLE UNTIL THEY HAVE BEEN ACCEPTED BY THE PROJECT'S TECHNOLOGY CONSULTANT.

f. Certifications: The contractor shall submit all of the following certifications and the certifications must contain dates which are valid from the date of proposal and not expirer any sooner than 12 months after substantial completion of the project.

1) Installer Certification: This certification shall show successful completion of system training and must be held by at least 25% of the, on-site, staff and be made available at the site if requested by the owner, architect, and/or project's technology consultant.

g. District Standard Compliance: Contractor shall attach a copy of the Telecommunications Specifications and Installation Standards PDF (English) found at https://www.lodiusd.net/about/projects indicating compliance and adherence to all district standards of telecommunication installation means and methods.

B. Shop Drawings:

1. Submit the following items, for Owner review and approval, within twenty-eight (28) days of notice to proceed:

a. Floor plans indicating proposed cable routing and cable grouping plan prepared by a qualified system designer. The credentials of the designer must be accepted the project's technology consultant prior to submitting a system design.

b. In addition to the cable routing, the submitted drawings shall indicate the following, even if the following is expected to be provided by the project's electrical or general contractor:

1) Location of wall penetrations (all penetrations shall be sleeved and contain protective bushings at both ends)
2) Location of sleeved wall pass-thru
3) Size of sleeve at each location installed
4) Quantity of cable passing through each sleeve
5) **Location of all A/V devices including but not limited to displays, speakers, enclosures, input/output plates, and control panels in each room**
6) Conduit routing, size, quantity, and stub-up locations for all floor mounted outlets.

7) **One-line schematics of each system and/or system type.**

c. Drawing Compliance: A letter shall be provided stating that the Audio-Video installer complies with the ENTIRE project drawing, including all general, keyed, and notes to contractor. If the installer intends to deviate from any portion of the specifications, a detailed explanation of reason in which the installer would like to deviate shall be provided in addition to the specification compliance letter. NO DEVIATIONS SHALL BE ACCEPTABLE UNTIL THEY HAVE BEEN ACCEPTED BY THE OWNER.

C. Close-out Procedures:

1. Two (2) copies of the following documents shall be delivered to the building owner's representative at the time of system acceptance. The close out submittals shall include:
   a. Inspection and Test Reports: During the course of the Project, the Contractor shall maintain an adequate inspection system to ensure that the materials supplied and the work performed, conform to contract requirements. The Contractor shall provide written documentation that indicates that materials acceptance testing was conducted as specified. The Contractor shall also provide documentation, which indicates that all cable termination testing was completed and that all irregularities were corrected prior to job completion.
   b. Provide complete test reports for all cabling and devices that comprise system as outlined in this document.
   c. Include the Name, address and telephone of the authorized factory representative with a 24-hour emergency service number.
   d. The manual shall also include Manufacturer’s data sheets and installation manuals/instructions for all equipment installed, a list of recommended spare parts.
   e. Generic or typical owner’s instruction and operation manual shall not be acceptable to fulfill this requirement.
   f. An up-to-date record (“as-built”) set of approved shop drawing prints that have been revised to show each and every change made to the structure cabling system from the original approved shop drawings. Drawings shall consist of a scaled plan of each building showing the placement of each individual item of the Audio-Video system equipment as well as raceway size and routing, junction boxes, and conductor size, quantity, and color in each raceway.
   g. As-built Drawings shall include cable pathways, and device locations with correct labeling. The as-built drawings shall be prepared using AutoCAD 2021 or later. Provide the Owner with electronic versions of the as-builts on 2 quantity 8GB thumb drive media.
   h. All drawings must reflect point to point wiring, device address and programmed characteristics as verified in the presence of the engineer and/or the end user unless device addressing is electronically generated, and automatically graphically self-documented by the system.
   i. A copy of the manufacturer’s warranty on the installed system.
   j. 5 sets of keys to cabinets and/or equipment and special maintenance tools required to repair, maintain, or service the system.
   k. Operating and Maintenance Instructions for all devices within the system. These instructions shall reflect any changes made during the course of construction, and shall be provided to the Owner, for their use, in a three-ring binder labeled with the project name and description. (4 copies)
   l. Quick-start Guide for each system written with the assumption that the intended reader is technically inexperienced and unfamiliar with the facility.

Quick-start Guide shall be provided in hard-copy format and in pdf format on an 8GB thumb drive with the close-out documentation.

m. Upon completion of the work and at a time designated by the Architect or owner, provide formal training sessions for the Owner's operating personnel to include location, operation, and maintenance of all included systems and equipment. Minimum amount of training time shall be at least 8 hours in four 2-hour sessions.

n. Contractor shall video record training sessions and include videos in close-out documentation in DVD format.

PART 2 - PRODUCTS

2.1 GENERAL

ALL PRODUCTS LISTED IN THIS SECTION SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.

A. Installation: The cabling shall be installed per requirements of the manufacturer and the Project Documents utilizing materials meeting all applicable EIA/BICSI standards. The Contractor is responsible for providing all incidental and/or miscellaneous hardware not explicitly specified below as required for a complete and operational system.

B. Materials: Materials shall be as listed or shall be approved equivalent products of other manufacturers meeting the intent and quality level of the EIA/BICSI specifications. All approved equivalent products will be published by addendum ten days prior to proposal for Architect/Engineer to review.

C. Testing: All installed cabling shall be tested 100% good after installation by the Contractor.

D. Ratings: All products shall be new and brought to the job site in the original manufacturer's packaging. Electrical components (including innerduct) shall bear the Underwriter's Laboratories label. All communications cable shall bear flammability testing ratings as follows:

CM Communications Cable
CMP Plenum Rated Communications Cable
CMR Riser-Rated Communications Cable

E. Initial Cable Inspection: The Contractor shall inspect all cable prior to installation to verify that it is identified properly on the reel identification label, that it is of the proper gauge, containing the correct number of pairs, etc. Note any buckling of the jacket that would indicate possible problems. Damaged cable or any other components failing to meet specifications shall not be used in the installation.

F. Cable Lubricants: Lubricants specifically designed for installing communications cable may be used to reduce pulling tension as necessary when pulling cable into conduit.

1. Approved Products
   a. Twisted-pair cable: Dyna-Blue
      American Polywater

G. Fire Wall Sealant: Any penetration through firewalls (including those in sleeves) will be resealed with an Underwriter Laboratories (UL) approved sealant.

1. Approved Products
   i. Wiremold Flamestopper - #FS4R-RED
   ii. Precut 4" conduit - #FSPCC4758

2.1 ADDITIONAL PARTS

A. Provide all materials listed in this specification section to furnish the media infrastructure from input component to output component, to furnish all classroom presentation system locations identified in drawings. Any change orders issued during the course of this project shall pull materials from this additional stock until the stock is depleted. In the event that that such stock is remaining upon the completion of the project, the contractor shall deliver the excess to the owner for attic stock.

2.2 CABLE ROUTING/PATHWAY

A. Cable Support System: All audio-video cabling shall be installed and supported using a Caddy Cable Cat or Arlington Loop cable support system at 4'-0" intervals unless installed in conduit. Do not exceed manufacture recommendation for the quantity of cables supported in an individual support.
B. All cable bundles shall be grouped together using plenum rated Velcro for the entire run above and below the ceilings.

2.3 PROMETHEAN INTERACTIVE DISPLAY (indicated as keynote 'T1' on drawings)

A. Provide All mounting hardware necessary for installation of OFCI Promethean Interactive Displays
B. Provide Hardware and mounting of Promethean Interactive Display panels in each classroom indicated on drawings.
C. For new construction, DSA approved drawings on following pages must be observed by both architect and installer.
    1. DSA standards must be followed
    2. Any non-standard mounts must be approved by F&P.
    3. All mounts must be tagged with contractor's name and date of installation. See DSA approved mounting documentation.
    4. HDMI cables mounted in raceway must be able to pass a clean digital signal, with an allowance for a standard quality user patch cable to span 35 feet.
        i. For example: If the user connects a 35-foot cable to the user interface/wall plate and the length of the infrastructure cable between the wall plate and the projector is 10 feet, then the total length of digital transmission is 45 feet; therefore, the installer must demonstrate that the infrastructure cable can deliver a clear picture while being extended with a 35-foot HDMI male-to-male patch cable. Sound must also be demonstrated through jacks in faceplates.

2.4 AV OUTPUT PLATE (indicated as 'AV' on drawings)

A. Data Contractor shall provide 1 Purple keystone jack routed to nearest MDF/IDF with Cat6A cable as per specification 27 10 00
    1. Beige jack shall be mounted in a Panduit Executive faceplate, located 29 inches below the ceiling, directly above the display (unless specified otherwise).

B. Provide (1) HDMI over IP via Cat6A output plate for routing to teachers input plate 'PS' and terminate with a converter box HDMI cable coiled behind the display. Coordinate with Data contractor for parts and methods, or refer to Specification 27 10 00

C. Additional HDMI passthrough plate shall be mounted centered beneath the Promethean Interactive display at 14" AFF for alternate input method to Display.

2.5 AV INPUT PLATE (indicated as 'PS' on drawings)

A. Provide (1) HDMI over IP via Cat6A input plate for routing to OFCI Promethean Interactive Display 'AV' plate. Coordinate with Data contractor for parts and methods, or refer to Specification 27 10 00

2.6 CLASSROOM AUDIO / VIDEO SYSTEM

A. Provide all software necessary to access full functionality of the system. All devices shall be licensed to the Owner without further chargers or recurring license fees
B. The System is to include all equipment, cabling, materials, labor, and training as required to install and test a complete operating System as described herein.
C. Contractor shall follow installation instructions provided by the manufacturer. Installation drawings shall show the location and general arrangement of equipment, electrical systems, and related items. They shall be followed as closely as elements of the construction will permit.
D. Contractor shall examine the installation drawings and verify the conditions governing the work on the job site. Contractor shall arrange accordingly, providing such fittings, horizontal cable raceways, conduits, junction boxes and accessories as may be required to meet such conditions.
E. Deviations from the installation drawings, except for minor changes in routing and other such incidental changes that do not affect the functioning or serviceability of the Systems, shall not be made without the written approval of the Engineer.

2.7 CLASSROOM AV SYSTEM COMPONENTS

A. **CEILING APPLICATION.** In classrooms with Drop Ceiling Tiles, the AV equipment must be routed through cable chase to termination locations via raceway or conduit down walls. (whichever is applicable to the room. Aka if the room is gypsum board walls, conduit shall be used. If the room is Concrete or cinderblock walls, raceway shall be used.)

B. **WALL APPLICATION**. In classrooms with open ceilings or hard-lid ceilings, the AV equipment shall have all cabling routed through raceways from plates to adjacent cable chases in ceiling center
    1. Approved products
        a. LD-5 – Panduit Raceway for Data/Wi-Fi/Access Control System
        b. LDP-10 – Panduit Raceway for Data/Voice/Coax
        c. T-70 – Panduit Raceway for Computer Lab that will accept communications and power
        d. CMBEI-X – Panduit Mini-Com Blank Ivory
        e. CFPSL4EIY – Panduit Classic Executive Faceplate, Sloped (anti-shear)
        f. JBX3510EI-A – Panduit Single gang Junction box
        g. Chatsworth Products Inc. (CPI)
        h. Owner-Approved product

C. Provide for each room equipped with a Promethean Interactive Display:
    1. 'HDMI' and / or 'PS' Outlet. All cabling shall be routed and connect to 'AV' and / or 'CMP/WMP' and / or 'LCD' device.
        a. HDMI over IP via Cat6A device and keystone. Label "AV Input"
        b. (1) HDMI Passthrough plate and panel with Panduit Executive plate and Panduit #CMHDMITWH Passthrough keystone.
            i. Label panel, "HDMI".

c. Label faceplates with a vinyl adhesive machine printed label, black lettering with white background.
d. Or approved equivalent

PART 3 - EXECUTION

3.1 GENERAL

A. Contractor is required to properly mount projector and connect all ceiling video/audio cables to projector component inputs.

B. Contractor is required to thoroughly test and verify operation of all projector inputs and video modes prior to project completion.

C. Contractor is required to focus and adjust projector to properly project image on viewing surface (screen or multimedia board depending on location).

D. Contractor shall provide owner with written verification test process and results once all projectors have been installed, tested, and placed in final condition.

E. Damage:
1. The Contractor shall replace or rework cables showing evidence of improper handling including stretches, kinks, short radius bends, over-tightened bindings, loosely twisted and over-twisted pairs at terminals and cable sheath removed too far (over 1/4 inches).

F. The Contractor shall replace any damaged ceiling tiles that are broken during cable installation.

G. Clean Up:
1. All clean up activity related to work performed will be the responsibility of the Contractor and must be completed daily before leaving the facility.

3.2 DOCUMENTATION

A. Contractor shall provide owner with detailed serial number listing and associated graphical room number designation equipment was installed. Contractor shall use actual graphical package room numbers not architectural plan numbers from construction set.

3.3 STATION WIRING INSTALLATION

A. General:
1. All cable must be handled with care during installation so as not to change performance specifications. Factory twists of each individual pair must be maintained up to the connection points at both ends of the cable. There shall never be more than one and one-half inches of unsheathed enhanced Category 6 UTP cable at either the wiring closet or the workstation termination locations.

B. Exposed Cable:
1. All cabling shall be installed inside walls or ceiling spaces whenever possible. Exposed station cable will only be run where indicated on the Drawings.
Additional exposed cable runs will require Owner approval, and will only be allowed when no other options exist.

C. Placement: All cabling and associated hardware shall be placed so as to make efficient

use of available space. All cabling and associated hardware shall be placed so as not to impair the Owner's efficient use of their full capacity.

D. Cable Routes:

1. All cabling placed in ceiling areas must be in conduit, cable tray or Caddy Cable Cat or Arlington Loop cable support. Cable supports shall be permanently anchored to building structure or substrates. Provide attachment hardware and anchors designed for the structure to which attached and that are suitably sized to carry the weight of the cables to be supported. Do not route cable through webbing of structural steel. Cabling must be supported in dedicated supports intended to support cabling as described in this section. Contractor shall adhere to the manufacturer's suggested fill ratio for each size cable support installed.

2. Attaching cable to pipes or other mechanical items is not permitted. Communications cable shall be rerouted so as to provide a minimum of 18 inches spacing from light fixtures, sources of heat, power feeder conduits and EMI sources. Cabling shall not be attached to ceiling. Grid support wires. Cable runs shall be routed down the corridors; parallel or perpendicular to building structure. Multiple cables to be bundled together at and between each cable support installed.

3. Contractor shall be responsible for coordinating with other trades on the project so that the installed cable pathway does not interfere with the installation of other systems to insure that mechanical ducts, pipes, conduits, or any other above ceiling systems are not putting unnecessary stress on any portion of the install audio-video cabling.

3.4 STATION HARDWARE

A. Flush Mount Jacks: Flush mount jacks shall be mounted in a faceplate with back box.

B. Placement: As shown on drawings.

3.5 TESTING, CERTIFICATION, WARRANTY, SERVICE

A. A factory trained service technician shall supervise the final connections and testing of the system and it shall be subject to the final acceptance of the Architect, Engineer, and local authorities. Testing shall ensure the following:
   1. Before energizing the cables and wires, check for correct connections and test for short-circuits, ground faults, continuity, and insulation.
   2. Complete and functional system.
   3. Installed in accordance with manufacturer's instructions.
   4. Upon completion of the testing, the manufacturer or his representative shall issue to the Owner a letter of certification attesting to the fact that he has tested and adjusted the system, that all components are properly installed and free of defects, and that the system is in compliance with this specification.

B. The contractor shall provide a warranty for the installed system. The warranty shall be against defects in material or workmanship for a period of one (1) year from the date of substantial completion. Any equipment or wiring shown to be defective shall be replaced, repaired, or adjusted free of charge. All labor and materials shall be provided at no expense to the Owner. All equipment will carry a one year warranty or manufacturer's warranty whichever is greater.

C. The system manufacturer shall maintain engineering and service departments capable of rendering advice regarding installation and final adjustment of the system.

3.6 DRAWINGS, MANUALS AND TRAINING

A. In addition, the contractor shall furnish complete operating and maintenance manuals listing the manufacturer's name(s), including technical data sheets. Manuals shall include wiring diagrams to indicate internal wiring for each device and the interconnections between the items of equipment. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate the equipment and system. Provide a parts list with manufacturer and model number for commonly replaced parts. Include complete instructions for the inspection, testing, and maintenance of the system. Include copies of all programming sheets used to configure the system.

B. As-built Drawings shall include locations of cable pathways, access points, card readers, distribution cabinets, intercoms, jacks, NVRs, security cameras, workstations, and MDF/IDF locations. The As-Built drawings shall be provided using Microsoft Visio. Always use icons from the Visio stencils provided by LUSD. Provide the Owner with electronic versions of the As-Builts on (2) 8GB thumb drives.
    1. On As-built Drawings:
        i. Active components between an endpoint and NVR/Swtich must be documented (i.e. power injectors, switches/repeaters, hubs, etc.)
        ii. Access control components must have power sources identified.
        iii. Jacks must be accompanied by a jack label.
        iv. Nodes must be accompanied by an IP address.

C. The Contractor shall conduct formal on-site training sessions. Provide documented general instruction as follows:
    1. Provide instruction to District personnel to include the location, inspection, maintenance, testing, and operation of all system components. Provide a minimum of four (8) hours -- four 2-hour sessions separated by a minimum of two weeks.
    2. Provide instruction to designated personnel on the functions and operation of the intercom and master clock system including emergency and service request procedures. Provide a minimum of four (4) hours--two 2-hour sessions separated by a minimum of two weeks.

END OF SECTION

SECTION 27 51 23 – INTEGRATED ELECTRONIC COMMUNICATIONS AND CLOCK NETWORK

PART 1 – GENERAL

The conditions of the Contract and Division 1 apply to this Section.

1.01 GENERAL REQUIREMENTS

A. The conditions of the General Contract (General, Supplementary, and other Conditions) and the General Requirements are hereby made a part of this Section.

B. All bids shall be based on the equipment as specified herein. The catalog numbers and model designations are that of the Algo Intercom system. No alternates or substitutions shall be accepted.

C. The contractor shall provide the FCC registration number of the proposed system, where applicable.

D. The contractor for this work shall have read all the bidding requirements, the general requirements of Division 1, and the contract proposal forms, and shall be held to the execution of this work. The contractor shall be bound by all the conditions and requirements therein.

E. The contractor shall be responsible for providing a complete functional system, including all necessary components whether included in this specification or not.

F. In preparing the bid, the contractor should consider that no claim will be made against the owner for any costs incurred by the contractor for any equipment demonstrations requested by the owner.

G. Should any discrepancy exist between the specifications and the drawings, the contractor shall provide the most valuable / highest in quantity devices and materials noted.

H. In preparing the bid, the contractor should consider that no claim will be made against the owner for any costs incurred by the contractor for any equipment demonstrations requested by the owner.

I. Lodi Unified School District Telecommunications Specifications found on LUSD website at https://www.lodiusd.net/about/projects
    a. All Specifications set forth herein are intended to supplement and enhance the existing district standards as delineated in the aforementioned document. However, these Specifications shall not supersede, override, or take precedence over the conditions, terms, or requirements stipulated therein, which shall remain controlling in the event of any conflict or inconsistency.

1.02 SCOPE OF WORK

The contractor shall furnish and install all new equipment, accessories, cabling, and materials in accordance with the specifications and drawings to provide a complete and operating VoIP school communications system including but not limited to the following products. Contractor shall note that in classrooms, all that is needed shall be provided for by the data contractor with a green keystone in Panduit executive faceplate. In recessed ceiling areas for new portable buildings, provide the following Algo products from the table. Contractor shall assume responsibility of fully functioning intercom system integrated into existing intercom system.

A. Comply with all applicable construction standards listed out on Lodi USD website at https://www.lodiusd.net/about/projects with direct reference to the Telecommunications Specifications and Installation Standards.

B. Owner Telephone System Connectivity

1. System shall be capable of connecting to the Public Switched Telephone Network (PSTN), analog Public Branch Exchange (PBX), or digital PBX/IP-PBX by connecting to an unlimited number of SIP trunks, analog FXO/FXS lines, or CO Trunks.

2. Telephone service with public utilities will be arranged by the owner in conjunction with the equipment supplier. Equipment supplier shall generate a one-page document that will provide the owner with the number of outside lines.

1.03 SUBMITTALS

A. Spec Sheets on all items including cable types

B. Outline drawing of system control cabinet showing relative position of all major components

C. Shop drawings, detailing integrated electronic communications network system including, but not limited to, the following:

1. Station wiring arrangement

2. Equipment cabinet detail drawing

D. Wiring diagrams showing typical connections for all equipment

E. District Standard Compliance: Contractor shall attach a copy of the Telecommunications Specifications and Installation Standards PDF (English) found at https://www.lodiusd.net/about/projects indicating compliance and adherence to all district standards of telecommunication installation means and methods.

1.04 QUALITY ASSURANCE

A. All items of equipment shall be designed by the manufacturer to function as a complete system and shall be accompanied by the manufacturer's complete service notes and drawings detailing all interconnections.

B. The contractor shall be an established communications and electronics contractor that maintains a locally run and operated business and has done so for at least 10 years. The contractor shall be a duly authorized distributor of the equipment supplied with full manufacturer's warranty privileges.

C. The contractor shall show satisfactory evidence, upon request, that he or she maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The contractor shall maintain at his or her facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

1.05 SINGLE SOURCE RESPONSIBILITY

A. Except where specifically noted otherwise, all equipment supplied shall be the standard product of a single manufacturer of known reputation and a minimum of 20 years of experience in the industry. The supplying contractor shall have attended the manufacturer's installation and service training classes. A certificate of this training shall be provided with the contractor's submittal.

1.06 SAFETY / COMPLIANCE TESTING

The communications system and its components shall, where applicable, bear the label of a Nationally Recognized Testing Laboratory (NRTL), such as Environmental Technology Laboratory (ETL), and shall be listed by their re-examination service. All work must be completed in strict accordance with all applicable electrical codes, under direction of a qualified and factory-approved contractor, and to the approval of the owner.

1.07 IN-SERVICE TRAINING

A. The contractor shall provide and implement a complete and comprehensive staff training program for all administrators, facility staff members, and teachers. This mandatory training program will provide school staff a complete understanding of how to utilize and properly operate all functions.

B. The training program shall be implemented by a staff member/trainer employed by the contractor. The trainer must be factory certified to provide training on their product.

C. All staff development training is to be coordinated through the owner's designated representative. As training sessions are completed, the trainer will provide the school's administrative staff and school district's staff a document listing all of the staff and faculty members who attended, received, and completed the training program.

D. The contractor shall provide a minimum of eight hours of in-service training with this system. These sessions shall be broken into segments, which will facilitate the training of individuals in the operation of this system. User Guides shall be provided at the time of this training.

1.08 WIRING

A. System wiring and equipment installation shall be in accordance with generally-accepted engineering best practices as established by the EIA and the NEC. Wiring shall meet all state and local electrical codes. All wiring shall be tested to be free from grounds and shorts.

B. All system wiring shall be labeled at both ends of the cable. All labeling shall be based on the room numbers as indicated in the architectural graphics package.

C. Wiring shall be done per manufacturer's recommendation (Cat6A) depending on speaker type. All terminal connections are to be on barrier strips.

1.09 PROTECTION

A. The contractor shall provide all necessary transient protection on the AC power feed and on all station lines leaving or entering the building.

B. The contractor shall note on their system drawings, the type and location of these protection devices and all wiring information. Such devices are not to be installed above the ceiling.

1.10 SERVICE AND MAINTENANCE

A. The contractor shall provide a five-year equipment hardware warranty of the installed system against defects in material and workmanship. All materials shall be provided at no expense to the owner during normal working hours. The warranty period shall begin on 1st of the month following the date of shipment.

B. The contractor shall, at the owner's request, make available a service contract offering continuing factory authorized service of this system after the initial hardware and software warranty periods.

C. System shall include software maintenance that includes bug fixes and new feature releases for a period of six years.

D. The system manufacturer shall maintain engineering and service departments capable of rendering advice regarding installation and final adjustment of the system.

1.11 ALTERNATE & ALTERNATIVE PROPOSALS

A. Alternates

1. The Base proposal shall include all equipment described herein and / or depicted in the construction-drawing package, but shall not include any marked or listed Alternates.
2. All Alternates shall be listed, Marked as Additive or Deductive Amounts and Priced separately on the proposal form or by Contractor in a separate attachment if Proposal form does specifically have a place for Alternate prices.
3. Provide pricing for the following add alternates to the base proposal of this Section of work:

    a. None.

PART 2 - SYSTEM SPECIFICATION

2.01 MANUFACTURERS

A. Manufacturers, subject to compliance with requirements specifications, provide the following system:

Algo IP Intercom System

B. The specifying authority must approve any alternative system 14 days prior to bid day.

C. The intent is to establish a standard of quality, function, and features. It is the responsibility of the contractor to ensure that the proposed product meets or exceeds every standard set forth in these specifications.

D. The functions and features specified are vital to the operation of this facility; therefore, inclusion in the list of acceptable manufacturers does not release the contractor from strict compliance with the requirements of this specification.

2.02 EQUIPMENT

INTERCOM PRODUCTS			
Manufacturer	**Part Number**	**Description**	**Location**
Algo	8188	PoE SIP Ceiling Speaker	Recessed Locations
Algo	8188MEM	Hydrophobic Membrane Screen for 8188	Bathrooms, Kitchens, etc.
Algo	8186	LUSD Supplied; Not installed by contractor; contractor installs Panduit Up/Down Field Term plug in double gang double-deep weather tight bell box w/ cap.	Outdoor Locations, Multi-Purpose Rooms, Gyms, Locker Rooms, etc.
Algo	8180	Not installed by contractor; contractor installs green data jack in Panduit Executive faceplate	Classrooms

a. Clocks shall be OFOI Battery Clocks.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions, with the installer present, for compliance with requirements and other conditions affecting the performance of the Intercom System.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.02 EQUIPMENT MANUFACTURER'S REPRESENTATIVE

A. All work described herein to be done by the manufacturer's authorized representative shall be provided by a documented factory authorized representative of the basic line of equipment to be utilized.

B. As further qualification for bidding and participating in the work under this specification, the manufacturer's representative shall hold a valid C-10 Contractor's License issued by the Contractor's State License Board of [your state]. The manufacturer's representative shall have completed at least 10 projects of equal scope, giving satisfactory performance, and shall have been in the business of furnishing and installing sound systems of this type for at least five years. The manufacturer's representative shall be capable of being bonded to ensure the owner of performance and satisfactory service during the guarantee period.

C. The manufacturer's representative shall provide a letter with submittals from the manufacturer of all major equipment stating that the manufacturer's representative is an authorized distributor. This letter shall also state that the manufacturer guarantees service performance for the life of the equipment and that there will always be an authorized distributor assigned to service the area in which the system has been installed.

D. The contractor shall furnish a letter from the manufacturer of the equipment. This letter shall certify that the equipment has been installed according to factory intended practices, that all the components used in the system are compatible, and that all new portions of the systems are operating satisfactorily. Further, the contractor shall furnish a written unconditional guarantee, guaranteeing all parts and all labor for a period of five years after final acceptance of the project by the owner.

E. As-built Drawings shall include locations of cable pathways, access points, card readers, distribution cabinets, intercoms, jacks, NVRs, security cameras, workstations, and MDF/IDF locations. The As-Built drawings shall be provided using Microsoft Visio. Always use icons from the Visio stencils provided by LUSD. Provide the Owner with electronic versions of the As-Builts on (2) 8GB thumb drives.
    a. On As-built Drawings:
        i. Active components between an endpoint and NVR/Swtich must be documented (i.e. power injectors, switches/repeaters, hubs, etc.)
        ii. Access control components must have power sources identified.
        iii. Jacks must be accompanied by a jack label.
        iv. Nodes must be accompanied by an IP address.

3.03 DIVISION OF WORK

A. While all work included under this specification is the complete responsibility of the contractor, the following division of actual work listed shall occur:

1. The conduit, outlets, terminal cabinets, etc., which form part of the rough-in work, shall be furnished and installed completely by the electrical contractor.

2. The balance of the system, including installation of speakers and equipment, making all connections, etc., shall be performed by the manufacturer's authorized representative. The entire responsibility of the system, its operation, function, testing and complete maintenance for one year after final acceptance of the project by the owner, shall also be the responsibility of the manufacturer's authorized representative.

3.04 INSTALLATION

A. The installation, adjustment, testing, and final connection of all conduit, wiring, boxes, cabinets, etc., shall conform to local electrical requirements and shall be sized and installed in accordance with the manufacturer’s approved shop drawings.

B. Low-voltage wiring may be run exposed above ceiling areas where they are easily accessible.

C. The contractor shall install the new system at the location shown on the plans.

D. All Staff Stations and Call Switches shall be wall-mounted:

1. Mount at 54" AFF.
2. All wiring should be concealed.
3. Verify exact location with architect.
4. Avoid mounting near doors to prevent students from activating and running out of the rooms.

E. Admin Stations can be desk or wall mounted.

F. Speaker and telephone lines run above ceiling and not in conduit shall be tie-wrapped to a ceiling joist with a maximum spacing of 8' between supports. No wires shall be laid on top of ceiling tile.

G. Connect field cable to each Analog Speaker transformer using UL butt splices for #22 AWG wire.

H. Contractor shall provide a minimum of eight hours of configuration and operational instruction to school personnel.

   1. Bogen Communications, Inc., shall provide online “How To” videos for instructing the teaching staff on how to operate the Teacher Dashboard aspect of the system.

I. On the first school day following installation of the intercom system, the contractor shall provide a technician to stand by and assist in system operation.

J. Mark and label all demarks IDF and MDF points with destination point numbers. Rooms with more than one outlet shall be marked XXX-1, XXX-2, XXX-3, etc. where XXX is the room number.

K. No graphic room number shall exceed the sequence from 000001 through 899999.

   1. All outside speakers shall be on a separate Page Zone and Time Zone.
   2. All zones shall be laid out not to exceed 40 Watts (@25V) maximum per zone.
   3. All hallway speakers shall be tapped at 1 Watt (@25V) maximum.
   4. All outside horns shall be tapped at 3.75 Watts (@25V) maximum.
   5. All classroom speakers shall be tapped at ½ Watt (@25V) maximum.
   6. Large rooms, such as cafeterias, shall be tapped at 2 Watts (@25V) maximum.

L. Plug disconnect: All major equipment components shall be fully pluggable by means of multi-pin receptacles and matching plugs to provide for ease of maintenance and service.

M. Protection of cables: Cables within terminal cabinets, equipment racks, etc., shall be grouped and bundled (harnessed) as to type and laced with No. 12 cord waxed linen lacing twine or T and B wire-ties, or hook and loop cable management. Edge protection material shall be installed on edges of holes, lips of ducts, or any other point where cables or harnesses cross a metallic edge.

N. Cable identification: Cable conductors shall be color-coded and individual cables shall be individually identified. Each cable identification shall have a unique number located approximately 1-1/2" from cable connection at both ends of cable. Numbers shall be approximately 1/4" in height. These unique numbers shall appear on the As-Built Drawings.

O. Shielding: Cable shielding shall be capable of being connected to common ground at point of lowest audio level and shall be free from ground at any other point. Cable shields shall be terminated in the same manner as conductors.

P. Provide complete “in service" instructions of system operation to school personnel. Assist in programming of telephone system.

3.03 GROUNDING

A. The contractor shall provide equipment grounding connections for Integrated Telecommunications/Time/Audio/Media System as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to ensure permanent and effective grounds.

B. The contractor shall provide ground equipment, conductor, and cable shields to eliminate shock hazard and to minimize the greatest extent possible, ground loops, common mode returns, noise pickup, cross talk, and other impairments.

C. The contractor shall provide all necessary transient protection on the AC power feed and on all station lines leaving or entering the building.

D. The contractor shall note on their drawings the type and locations of these protection devices and all wiring information.

E. The contractor shall furnish and install a dedicated, isolated earth ground from the central equipment rack and bond to the incoming electrical service ground buss bar.

4.04 DOCUMENTATION

Provide the following directly to the Supervisor of Technology Services.

A. One printed copy of all field programming for all components in system

B. One copy of all diagnostic software with a copy of field programming data for each unit

C. One copy of all field wiring runs, location, and end designation of system

END OF SECTION

SECTION 28 31 00 FIRE DETECTION AND ALARM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Telecommunications Specifications and Installation Standards PDF found on LUSD website: https://www.lodiusd.net/about/projects

1.2 SUMMARY

A. This Section Includes:

1. Provide a complete, fully contained fully addressable Emergency Voice/Alarm Communications System to include full automatic detection, carbon monoxide detection, notification power supplies, control modules, control relays, input modules and notification appliances (speaker strobe combinations).. The system shall be connected, tested, verified by AHJ to be acceptable and left in first class operating condition. All equipment herein specified shall be engineer-approved and California State Fire Marshal (CSFM) listed. The entire installation shall conform to the National Fire Protection Association (NFPA) Standards 72 (2022 Edition), 90A (2022 Edition), and 101 (2022 Edition); the California Electrical Code (CEC) Article 760 (2022 Edition); the California Fire Code (CFC) (2022 Edition); and all applicable requirements of the Authorities Having Jurisdiction (AHJ). The system specified and depicted on the plan is a complete and approved system. The entire fire alarm system has been submitted and approved by the Division of the State Architect as a complete submittal. Any routing of the system wiring that is significantly different than shown on the approved drawings shall have the approval of the engineer and must be obtained prior to construction.
2. Provide all work and material as shown and / or required to provide a fully functional and adequate system as described hereon and as required by the California State Fire Marshal.
3. Supervision: The fire alarm system shall monitor the integrity of all alarm initiating and indicating appliance circuits and provide local and remote status of all connected systems. The system shall be provided with automatically charged standby batteries to maintain system operation for 24 HRS in the normal supervisory mode and 15 minutes of alarm. Batteries shall be supervised for connection to the system and low voltage threshold. The automatic battery charger shall be capable of charging fully discharged system batteries to 100% in 8 hours.
4. The system wiring and installation shall be as stated in drawings and as required by the manufacturer. All wiring shall be color coded, tagged and verified to assure that it is free from shorts and grounds and shall be rated for the appropriate environmental conditions such as well locations.
5. Testing: The completed system shall be tested in accordance with NFPA Standard 72 7.6.6 and 7.8.2.
6. All Fire Alarm wiring shown in drawings shall be installed in conduit, metal surface raceway, or open run above ceilings and supported by approved supporting methods.
7. System Operation shall include:
   a. Separate zone signaling and device status indication for all initiating devices.
   b. Audible to sound the California uniform fire alarm signal in temporal mode. Devices shall be at least 15dBA above average ambient sound level, but not less than 75dBA at 10’ or more than 120dBA.
   c. Visual devices shall not exceed 2 flashes per second and shall not be slower than

1 flash per second. Visual devices shall be synchronized when 3 or more devices are within the same field of view.
   d. Supervision of all circuits to indicate any abnormal wiring condition.
   e. N.O./N.C. integral relays for external device interface or as indicated on drawings.
   f. Central station connection capable of indicating (3) distinct separate signals as being tamper, trouble and alarm with point reporting capabilities.
8. All work shall be completed as shown on the plans and or as specified within this specification and shall include the following (but is not limited to):
   a. Life safety fire alarm detection and signaling system.
   b. Furnishing and installation of equipment and devices.
   c. Conductors, connections and interconnections where specified and all in conduit system.
   d. Conduit, wire and connections for control of heating and ventilation motors, smoke dampers and smoke exhaust.
   e. Testing, cleaning and adjusting of completed work.
   f. Wiring diagrams, as-built drawings and three (3) sets of equipment operations and maintenance instructions for Owner.
   g. Complete maintenance for two years.
   h. Proposal for subsequent maintenance contract.
   i. All work and material for complete and operable systems as indicated or specified.
   j. Permits, inspections and fees.
   k. Identification and instruction to Owner Representative. Training shall consist of a minimum or two (2) 6-hour sessions.
9. Coordination with Section 26 05 33: Raceway and Boxes for Electrical Systems.
10. Furnishing of special back boxes where required for installation of fire alarm devices.
11. All conductors to be installed in conduit pursuant to Specification Section 26 05 33: Raceway and Boxes for Electrical Systems.
12. Qualifications: Contractor shall receive written approval and verified test results which shall be submitted to the owner for system from manufacturers recognized representative prior to completion and acceptance.
13. All initiating devices shall be separately addressed for individual identification at control panel.
14. As-Built Drawings: A complete set of reproducible “as-built” drawings showing installed wiring, color coding, wire tag notations exact locations of all installed equipment, specific interconnections between all equipment and internal wiring of the equipment shall be delivered to the owner upon completion of the system.
15. Maintenance Instructions: Three (3) submittals of maintenance instructions shall be provided and shall be complete, easy to read, understandable and shall provide the following information:
   a. Instructions for replacing any components of the system, including internal parts.
   b. Instructions for periodic cleaning and adjustments of equipment with a schedule of these functions.
   c. A complete list of all equipment and components with information as to the address and telephone number of both the manufacturer and local supplier of each item.
   d. User operating instructions shall be prominently displayed on a separate sheet located next to the control unit in accordance with UL Standard 864. The contractor shall warrant all equipment and wiring free from inherent mechanical and electrical defects for two years from the date of final acceptance.

B. Substitutions
1. Substitution of system components or manufacturer will require the contractor to separately obtain approval with the CSFM at Contractor’s expense and shall meet all requirements of the system as designed and pre-approved.
2. All proposed substitutions shall be listed with the California State Fire Marshal.

1.3 SUBMITTALS

A. Comply with applicable provisions of Section 26 05 00: Common Work Results for Electrical.

B. Comply with applicable district standards by attaching acknowledged copy of Telecommunications Specifications and Installation Standards PDF found on LUSD website here: https://www.lodiusd.net/about/projects

C. Product Data:
   1. A complete list of all supplied equipment including model numbers with catalog data sheets on each component.
   2. Data sheets show California State Fire Marshal Listing, U.L. listing, equipment ratings, dimensions and finishes.
   3. Highlight actual devices to be used and their amp draw in stand-by and alarm modes.

D. Shop Drawings:
   1. Provide schematic layout, floor plan, drawings indicating location of all components and equipment, required size and location of conduit and outlets and type and quantity of system conductors. Include voltage drop calculations and battery calculations based on actual number of devices to be installed.
   2. Include riser and wiring diagrams for overall system and components including control panels, annunciators, power supplies, initiating circuits, notification appliances, control devices and FATC. Address numbers shall be noted on all devices and appliances.
   3. Include physical and electrical characteristics of equipment to indicate conformance with the Specifications.
   4. Describe system characteristics and function as well as device wiring diagrams.
   5. Voltage loss and battery calculations for each control panel and power supply and notification appliance circuits at 24 hour stand-by and 15 mins alarm.
   6. System operational matrix.
   7. Reproduced copies of the bid set of drawings are not acceptable as “shop drawings”.

E. Operating and Maintenance Instruction Manual:
   1. Manual shall include the following tailored to this specific project:
      a. Operational description.
      b. Coded cabling plan.
      c. Two wire circuit diagrams.
      d. Wiring destination schedule.
      e. Schematic component diagrams and PC board layouts.
      f. Maintenance and alignment procedures.
      g. Voltage drop and battery calculations.

1.4 PERFORMANCE REQUIREMENTS

A. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Style Y (Class B) Signaling Line Circuits (SLC).

B. Device Circuits (IDC) shall be wired Class B (NFPA Style Y) as part of an addressable device connected by the SLC Circuit.

C. Notification Appliance Circuits (NAC) shall be wired Class b (NFPA Style Y).

D. On Style 6 or 7 (Class A) configurations a single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.

E. Alarm signals arriving at the FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.

F. NAC circuits and control equipment shall be arranged such that loss of any one (1) NAC circuit will not cause the loss of any other NAC circuit in the system.

G. Two-way emergency telephone communication circuits shall be supervised for open and short circuit conditions.

1.5 QUALITY ASSURANCE

A. Loads of Equipment and Components
   a. Follow IEEE Standard where applicable.
   b. Provide fuse protection for equipment and spare fuses.
   c. Design systems for operation at 120 volts, normal or emergency power as indicated, 60 Hz nominal input.
   d. Operating voltage dissipated by resistors shall not exceed 25% of ratings.
   e. Operating voltage of capacitors shall not exceed 80% of rated voltage.
   f. Operating loads and voltages on transistors and solid-state devices shall not exceed manufacturer's recommendation for normal full load operation.
   g. Use electronic components of types and rating commonly available from stock of established commercial distribution.

B. Regulatory Requirements
   1. The specifications and standards listed below form a part of this specification. The system shall fully comply with the latest issue of these standards, if applicable.
   2. National Fire Protection Association (NFPA) – USA:
      a. NFPA 70: California Electrical Code (CEC)
      b. NFPA 72: National Fire Alarm Code
      c. NFPA 101: Life Safety Code
   3. Underwriters Laboratories Inc. (UL):
      a. UL 38: Manually Actuated Signaling Boxes
      b. UL 268: Smoke Detectors for Fire Protective Signaling Systems
      c. UL 464: Audible Signaling Appliances
      d. UL 521: Heat Detectors for Fire Protective Signaling Systems
      e. UL 864: Control Units for Fire Protective Signaling Systems
      f. UL 1480: Speakers for Fire Alarm and Signaling Systems, Including Accessories
      g. UL 1481: Power Supplies for Fire Protective Signaling Systems
      h. UL 1711: Standard for Amplifiers for Fire Protective Signaling Systems
      i. UL 1712: Tests for Ampacity of Insulated Electrical Conductors Installed in Fire Protective System
      j. UL 1971: Visual Notification Appliances
      k. UL 2572: Mass Notification Systems
   4. Local and State Building Code, including but not limited to:
      a. California Building Code
      b. California Electric Code
      c. California Fire Code
   5. All requirements of the Authority Having Jurisdiction (AHJ).

1.6 WARRANTY

A. For a period of two years from date of final acceptance, the system shall be under full guarantee for materials and labor at no cost to the Owner. The system shall be under a service contract with a technician authorized by the manufacturer. Replacement parts and labor shall be readily available during normal business hours while the service contract is in effect. A complete system inspection and test shall be performed at five months and again at eleven months after final acceptance. Tests shall include all smoke detector sensitivity settings.

B. Conform to applicable provisions of the General Requirements.

C. Service technicians and replacement components for the system shall be available locally from a service representative of the manufacturer who is able to provide evidence of technical training and authorization by the manufacturer.

D. All component failures shall be remedied to the satisfaction of the Owner.

E. A continuing service contract shall be offered at time of bid to commence at the expiration of warranty included with the system.

PART 2 PRODUCT

2.1 MANUFACTURERS

A. Main Fire Alarm Control Panel (FACP/EVAC): Gamewell (District standard)

B. Remote Power Supply (RPS): Gamewell (District standard)

C. Intelligent Loop Interface-Main Board: Gamewell (District standard)

D. Area Smoke Detectors and Heat Detectors: Gamewell (District standard)

E. CO Smoke Detector: Gamewell (District standard)

F. Addressable Manual Pull Stations: Gamewell (District standard)

G. Relay and Monitor Modules: Gamewell (District standard)

H. Strobes, Combination Speaker and Strobes, and Weatherproof Speaker: System Sensor

2.2 MATERIALS

A. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system-controlled devices.

B. System Devices and components shall be provided as specified on the fire alarm equipment legend and as shown on associated electrical drawing.

PART 3 EXECUTION

3.1 COORDINATION

A. Refer to the drawings and specifications to determine quantities and location of devices and required scope of work. Provide function described under mechanical section Sequence of Control, for fire and/or emergency conditions.

3.2 GENERAL

A. Comply with all applicable paragraphs in this section.

B. Install system(s) in accordance with manufacturer's instructions.

C. Include services of certified technicians to supervise installation, provide adjustments, provide final connections, system testing and system training to Owner Representative

3.3 INSTALLATION

A. Installation shall be in accordance with the CFC, CEC, CMC, 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.

3.4 GROUNDING

A. All equipment to be grounded by means of green ground wire to "U" contact of duplex receptacles and bonded to ground provided under 26 05 26: Grounding and Bonding of Electrical Systems.

B. Provide and install transient circuit protection in accordance with NFPA 72, NFPA 70, Article 760, and CFC.

3.5 INSPECTION

A. Systems to meet all the requirements of the CSFM, IOR, DSA and AHJ and shall be approved thereby before installation and prior to final acceptance.

3.6 LOCATION

A. Before installation, verify exact location of control equipment and outlets. The Owner reserves the right to relocate system components within a radius of 10' at no increase in cost before rough-in work is started for the respective component.

3.7 WIRING

A. Furnish all conduit, conductors, equipment, terminal strips, etc., and labor to install a complete and operable system. All cable conductors shall be color coded and numbered for identification at all terminals. Green shall be for grounding conductor only. Use red insulation and or red jacketing on all fire alarm cable unless otherwise approved by the Authority Having Jurisdiction.

3.8 TESTING

A. After all equipment specified herein for each system has been installed and is in operating condition, conduct performance tests to determine if the installation and components comply

with these specifications. Furnish competent personnel, all test material and approved test instruments and conduct the tests under supervision of factory personnel, in the presence of the Engineer, the building and fire inspecting agencies:

1. The contractor's job foreman, in the presence of a representative of the manufacturer, a representative of the owner, and the fire department shall operate every installed device to verify proper operation and correct annunciation at the control panel.
2. At least on half of all tests shall be performed on battery standby power.
3. Where application of heat would destroy any detector, it may be manually activated.
4. The signaling line circuits and notification appliance circuits shall be opened in at least two (2) locations to verify the presence of supervision.
5. When the testing has been completed to the satisfaction of the contractor representative IOR, representatives of the manufacturer and owner, a notarized letter co-signed by each attesting to the satisfactory completion of said testing shall be forwarded to the owner and the authority having jurisdiction.
6. The contractor shall leave the fire alarm system in proper working order, and, without additional expense to the owner, shall replace any defective materials or equipment provided by him under this contract within two years from the date of final acceptance by the awarding authority.
7. The local responding fire department must be notified prior to the final test in accordance with local requirements and when requested, participate in system testing and evaluation.

3.9 REPORT

A. Prepare written report of final test results, signed by witnessing parties. Submit to the Engineer in triplicate for final approval.

END OF SECTION 28 31 00

SECTION 31 00 00 EARTHWORK

PART 1 - GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 50 00, Construction Facilities and Temporary Controls.

B. Section 01 57 13, Erosion Control

C. Section 31 23 33, Trenching and Backfilling.

D. Section 32 12 00, Asphalt Concrete Paving.

E. Section 32 16 00, Site Concrete.

F. Section 32 80 00, Irrigation.

G. Section 32 90 00, Landscaping.

H. Section 33 40 00, Site Drainage.

I. Section 31 32 00, Soil Stabilization

1.3 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

C. The representatives of the Owner’s testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner’s testing lab representatives nor the testing by the Owner’s testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

D. Tests (See Part 3 for Compaction Testing).

E. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.

1.4 SUBMITTALS

A. Manufacturer's Data: Submit list and complete descriptive data of all products proposed for

use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

1.5 WARRANTY

A. Refer to General Conditions and Section 01 78 36.

1.6 REFERENCES AND STANDARDS

A. General: Site survey, included in the drawings, was prepared by Warren Consulting Engineers, Inc., dated December 12, 2021, and is the basis for data regarding current conditions. While the survey is deemed generally accurate, there exists discrepancies and variations due to elapsed time, weather, etc. Existing dirt grades may vary 0.2 ft. from that shown.

B. Geotechnical Engineering Report was prepared by Terracon. Report is entitled Davis Elementary School Modernization, dated December 2, 2024 and is on file with Architect. Recommendations of the Goetechnical report were used to develop the contract plans and specifications. The Geotechnical report shall be used as a reference for the soil condition of the project site. The design information contained in the contract plans and specifications shall govern over the recommendation of the Geotechnical report.

C. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

D. ASTM International (ASTM):
1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-12E1 - 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.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-17E1 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

G. Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.

1.7 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

B. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this Section and that arrangements have been made to properly store, handle and protect such materials and work.

1.8 PROJECT CONDITIONS

A. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

B. Excavation dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for excavation dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.9 EXISTING SITE CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.10 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

A. Ground-breaking requirements:
   1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
   2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.

B. Underground Utility Locating:
   1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas affected by the scope of work for excavation.
   2. Contractor must use an underground utility locator service with a minimum of 3 years' experience. The equipment operator must have demonstrated experience.
   3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radio detection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
   4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
   5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
      a) All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
      b) All conduit pathways containing an active cable TV system.
      c) All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
      d) All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
      e) All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
      f) All plastic and other nonconductive water lines in which a TransOnde Radio dectection) or other "transmitter" can be applied to create a low frequency pressure waive (signal) without damaging or triggering the existing systems.
      g) All copper or steel waterlines and plastic or steel gas lines
   6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
   7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
   8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to

permanent buildings. Contractor will deliver one copy to the district at no additional charge.

9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager) (Architect) (Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.11 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullying of sides of excavation.

E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.12 SEASONAL LIMITS

A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

B. Excessively wet fill material shall be bladed and aerated per section 3.08, B.

1.13 TESTING

A. General: Refer to Section 01 45 00 – Quality Requirements.

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and back charged to Contractor.

1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

1.14 ARCHEOLOGICAL AND CULTURAL RESOURCES

A. If archeological or cultural resources are discovered during the Work, the Contractor must cease all construction operations in the vicinity of the discovery until a qualified archeologist can assess the value of these resources and make recommendations to the State Historic Preservation Officer. Archeological and cultural resources include artifacts, large amounts of bone, shell, or flaked stone, and other evidence of human activity. If the State Historic Preservation Officer or the Owner directs that work be temporarily ceased at the location of an archeological or cultural find, the Contractor must temporarily suspend work at the location.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 18 inches of any fill. Native clay or clayey soils will not be permitted within the upper 18 inches of building pad areas or paved areas.

B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 10 or less; an Expansion Index of 20 or less; be free of particles greater than 3-inches in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
   1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with the testing will be paid by the contractor.
   2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory http://www.dtsc.ca.gov/Schools/upload/SMP FS Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
      Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
   3. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sampling Schedule

Area of Individual Borrow Area	**Sampling Requirements**
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ Acre
4 to 10 Acres	Minimum of 8 Samples
Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic Yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

4. Reports/ Documentation
   a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.

C. Landscape Backfill Material:
   1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material provided it meets the requirements as specified in Section 329000.
   2. Imported Topsoil may be required to complete work. See Section 329000 for requirements. Proposed Topsoil material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.

D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.

E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.

PART 3 – EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence

B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

C. Verify that specified items may be installed in accordance with the approved design.

D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:
1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES TESTING AND OBSERVATION

A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.

B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.

C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.

E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.4 CLEARING AND GRUBBING

A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.07, 3.08, 3.09, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Stripping's meeting the requirements of Section 32 90 00 may be used in landscape areas only.

3.5 CUTTING

A. Do all cutting necessary to bring finish grade to elevations shown on Drawings.

B. When excavation through roots is necessary, cut roots by hand.

C. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.6 STRUCTURAL EXCAVATION

A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.

B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed.

C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 90% of dry density.

3.7 SUBGRADE PREPARATION

A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.

B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 18", until surface is free from ruts, hummocks or other uneven features and uniform and free from large clods. Moisture condition to 2% above optimum moisture content and recompact to at least 90% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or disking to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.

C. Subgrade in areas to receive landscaping shall be compacted to 90%.

D. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.8 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.

B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.

C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly

compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.

D. Recompaction of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum) moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

E. Jetting of fill materials will not be allowed.

3.9 FINAL SUBGRADE COMPACTION

A. Building Pads: Upper 18" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 95% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
   1. Exception; in lime /cement treated areas the upper 18" shall be compacted to 95% Compaction.

B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
   1. Exception; in lime /cement treated areas the upper 18" shall be compacted to ____% Compaction.

C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.

D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.10 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 90% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.

B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.11 SLOPE CONSTRUCTION

A. Cut slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical).

3.12 FINISH GRADING

A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish

grades shall be “flat graded” to grades shown on the drawing. Mounding of finish grades will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be +-0.05’. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

B. All landscape areas shall be left free of rock or foreign material as specified in Section 32 90 00.

C. All landscape areas shall be approved by Architect prior to any planting.

3.13 SURPLUS MATERIAL

A. Excavated material not required for grading or backfill shall be removed from site at contractor’s expense.

3.14 CLEANING

A. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION 31 00 00

SECTION 31 23 33 TRENCHING AND BACKFILLING

PART 1 – GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The general conditions, supplementary conditions and Division 1 are fully applicable to this section as if repeated herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 50 00, Construction Facilities and Temporary Controls.

B. Section 31 00 00, Earthwork.

C. Section 31 32 00 Soil Stabilization

D. Section 33 40 00, Site Drainage.

E. Section 33 00 00, Site Utilities.

F. Section 32 80 00, Irrigation.

G. Section 32 12 00, Asphalt Concrete Paving

1.3 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

C. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

1.4 SUBMITTALS

A. Submit Manufacturers data and shop drawings.

1.5 WARRANTY

A. Submit fully executed warranty for work and materials in this section.

1.6 REFERENCES AND STANDARDS

A. California Building Code current edition.

B. California Plumbing Code current edition.

1.7 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

B. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this Section and that arrangements have been made to properly store, handle and protect such materials and work.

1.8 PROJECT CONDITIONS

A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

B. Field verify that all components, backing, etc. by others are installed correctly to proceed with installation of products as herein specified.

C. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.9 PROTECTION

A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullying of sides of excavation.

E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.

F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.

H. Trees: Carefully protect existing trees which are to remain.

1.10 TRENCH SAFETY PROVISIONS

A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system

standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.

B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.

C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.11 SEASONAL LIMITS

A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

B. Material above optimum moisture shall be processed per section 31 00 00, 3.08, B.

1.12 TESTING

A. General: Refer to Section 01 45 00 – Quality Requirements.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
1. ¾ inch crush rock.
2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than __-inches.
3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
4. Lean Mix Concrete/Controlled Density Backfill: 2 sacks cement slurry.
5. Class 2 aggregate base, ¾” rock, per Caltrans section 26-1.02B

B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.

C. Provide other bedding and backfill materials as described and specified in Section 31 00 00, Section 33 40 00 and Divisions 15 and 16.

PART 3 – EXECUTION

3.1 INSPECTION

A. Verification of Conditions:
1. Examine areas and conditions under which work is to be performed.
2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 COORDINATION

A. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

3.3 INSTALLATION

A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.4 TRENCHING

A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.

B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
2. Storm drain pipe: depth to vary
3. Water pipe - Fire Supply: 36 inches
4. Water pipe – Domestic Supply: 30 inches

E. Where trench through existing pavement saw cut existing pavement in straight lines. Grind existing asphalt on each side of trench 3" wide x ½ the depth of the section. Apply tack coat to vertical surfaces before installing new asphalt. Replace asphalt and concrete pavement sections to match the existing conditions. All new asphalt patch shall receive two coats seal coat. In concrete pavement provide expansion and control joints to match existing joint layout.

3.5 BACKFILL

A. Pipe Trench Backfill is divided into two zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
2. Initial Backfill: Backfill from the top of the bedding to 12 inches (compacted) over the top of the pipe.

B. Bedding and Initial Backfill:
1. Type of material for Bedding and Pipe Zone shall be as required by Drawings.
2. Compaction of Bedding and Initial Backfill shall be achieved by vibratory plate as necessary to consolidate material.
3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.

C. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a

placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.

2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met, see section 310000, 3.08, B.
3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 90% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
4. The top 18 inches of subgrade compaction under pavement or building shall be per Earthwork section 31 00 00.
5. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

3.6 TRENCH AND SITE RESTORATION

A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.7 PROTECTION

A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.

B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.

C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cute neatly and replaced with new materials.

D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.8 SURPLUS MATERIAL

A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.9 CLEANING

A. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.

B. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

END OF SECTION 31 23 33

SECTION 31 32 00 SOIL STABILIZATION

PART 1 – GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 50 00, Construction Facilities and Temporary Controls.

B. Section 31 00 00 Earthwork

C. Section 31 23 33, Trenching and Backfilling.

1.3 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

C. The representatives of the Owner’s testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner’s testing lab representatives nor the testing by the Owner’s testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.

D. Tests (See Part 3 for Compaction Testing).

E. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.

F. Failures due to the lack of continuous moisture control during the curing period will be the sole responsibility of the contractor.

G. Any trenching through the finished cured lime/cement section will result in the contractor having to backfill trench with class 2 aggregate base rock, or cement/sand slurry,

1.4 SUBMITTALS

A. Refer to Section 01 33 00.

1.5 WARRANTY

A. Refer to General Conditions and Section 01 78 36.

1.6 SCOPE OF WORK

A. Description: Provide Lime Stabilization Treatment, including spreading and mixing lime and water with in-place materials, and compacting the mixture to the lines, grades and dimensions shown on the plans and/or specified.

B. Related Work Specified Elsewhere:
   1. Measure and Payment: Section 01 29 00.

1.7 QUALITY ASSURANCE

A. General: All Quality Assurance procedures specified on the drawings shall apply to this Section in addition to those shown below.

B. Testing:
   1. Geotechnical Engineer: Owner is retaining a Geotechnical engineer to determine compliance of Lime Stabilization Treatment with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except that costs incurred for re-tests or re-inspection will be paid by Owner and back charged to Contractor.

C. Inspection: Work shall not be performed without the physical presence and approval of Geotechnical Engineer. The Contractor shall notify the Geotechnical Engineer at least two working days prior to commencement of any aspect of site earthwork.

D. Field Density: Field density and phenolphthalein reaction tests shall be made by the Geotechnical Engineer after completion of compaction. Where compaction equipment has disturbed the surface to a depth of several inches, density tests shall be taken in the compacted material below the disturbed surface.

1.8 SUBMITTALS

A. Weighmaster Certificates: Provide certificates as required in Section 2.01B.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Lime Treated Engineered Fill: The materials to be treated shall consist of on-site soils or approved import material as described in Section 31 00 00.

B. Lime: Lime in areas to be treated shall be lime. The percentage of lime shall be based on a soil weight of 100 pcf; hence, 5 pounds lime should be utilized per square foot. A certification of compliance shall be submitted to the Geotechnical Engineer with each delivery of lime.

C. Water: Water shall be added during the preliminary mixing operations and, if necessary, during final mixing and to keep the cured material moist until curing is complete. The amount of water added shall be subject to the approval of the Geotechnical Engineer at all times.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Layout all work, establish grades, locate existing underground utilities, set markers and stakes, set up and maintain barricades and protection facilities; all prior to beginning actual earthwork operations.

3.2 EQUIPMENT

A. Lime Spreader: The lime shall be spread by equipment which shall uniformly distribute the required amount of lime. The rate of spread per square foot of blanket shall not vary more than 5 percent from the designated rate, unless otherwise approved by the Geotechnical Engineer.

B. Mixing Equipment: Mixing equipment shall be capable of mixing or remixing the materials to a uniform mixture free of streaks or pockets of lime to the full required depth.

3.3 START OF WORK UNDER THIS SECTION

A. General: Prior to starting physical work under this Section, the property line is to be clearly staked and identified. No lime treated materials shall be allowed to contaminate areas outside of the property.

B. Utilities; Contractor is to engage with a licensed contractor specialized in the Utility Locating Business. The contractor shall locate any and all utilities and pothole the same. The frequency of potholing shall be enough to establish the elevations of all utilities located.

3.4 LIME SPREADING

A. Engineered Fill: Provide lime treatment in areas shown on plans and extending a minimum distance of 5 feet from outside edge of curb, building footing, wood header, and to a depth of at least 18-inches.

B. Temperature: Lime shall not be spread while the atmospheric temperature is below 35 degrees Fahrenheit or when conditions indicate that the temperature may fall below 35 degrees Fahrenheit within 24 hours.

3.5 MIXING

A. Lime shall be added to the material to be treated at a rate of 5 pounds lime cement per square foot based on a soil unit weight of 100 pcf.

B. Lime shall be spread by equipment that will uniformly distribute the required amount of lime for the full width of the prepared material. The rate of spread per linear foot of blanket shall not vary more than five percent (5%) from the designated rate.

C. The spread lime shall be prevented from blowing by suitable means selected by the Contractor. Quicklime shall not be used to make lime slurry. The spreading operations shall be conducted in such a manner that a hazard is not present to construction personnel or the public. All lime spread shall be thoroughly mixed into the soil the same day lime spreading operations are performed.

D. The distance which lime may be spread upon the prepared material ahead of the mixing operation will be determined by the Geotechnical Engineer.

E. No traffic other than the mixing equipment and water truck will be allowed to pass over the spread lime until after the completion of mixing. After mixing, grading and compacting are

completed, only the water truck is allowed on the treated area to maintain the optimum moisture for curing.

F. Mixing equipment shall be equipped with a visual depth indicator showing mixing depth, an odometer or footmeter to indicate travel speed and a controllable water additive system for regulating water added to the mixture.

G. Mixing equipment shall be of the type that can mix the full depth of the treatment specified and leave a relatively smooth bottom of the treated section. Mixing and re-mixing, regardless of equipment used, will continue until the material is uniformly mixed free of streaks, pockets, or clods of lime), and moisture is at approximately two percent (2%) over optimum and the mixture complies with the following requirements:

Minimum Sieve Size	Percent Passing
1-1/2”	100
1”	95
No. 4	60

H. Non-uniformity of color reaction when the treated material, exclusive of one inch or larger clods, as tested with the standard phenolphthalein alcohol indicator, will be considered evidence of inadequate mixing.

I. Lime -treated material shall not be mixed or spread while the atmospheric temperature is below 35°F. The entire mixing operation shall be completed within seventy-two (72) hours of the initial spreading of lime, unless otherwise permitted by the Geotechnical Engineer.

3.6 SPREADING AND COMPACTING

A. The treated mixture shall be spread to the required width, grade and cross-section. The maximum compacted thickness of a single layer may be determined by the Contractor provided he can demonstrate to the Geotechnical Engineer that his equipment and method of operation will provide uniform distribution of the lime and the required compacted density throughout the layer. If the Contractor is unable to achieve uniformity and density throughout the thickness selected, he shall rework the affected area using thinner lifts until a satisfactory treated subgrade meeting the distribution and density requirements is attained, as determined by the Geotechnical Engineer, at no additional cost to the Owner.

B. The finished thickness of the lime-treated material shall not vary more than five hundredths of a foot (0.05’) from the planned thickness at any point.

C. The lime-treated soils shall be compacted to a relative compaction of not less than ninety-five percent (95%) as determined by the ASTM D1557-01 Compaction Test.

D. Initial compaction shall be performed by means of a sheepsfoot type roller or a vibratory padfoot roller. Final rolling shall be by means of a smooth drum roller.

E. Areas inaccessible to rollers shall be compacted to meet the minimum compaction requirement by other means satisfactory to the Geotechnical Engineer.

F. Final compaction shall be completed within thirty-six (36) hours of final mixing. The surface of the finished lime-treated material shall be the grading plane and at any point shall not very more than five hundredths of a foot (0.05’) foot above or below the grade established by the plans.

G. Before final compaction, if the treated material is above the grade tolerance specified in this section, uncompacted excess material may be removed and used in areas inaccessible to mixing equipment. After final compaction and trimming, excess material shall be removed and disposed of off site. The trimmed and completed surface shall be rolled with steel or pneumatic-tired rollers. Minor indentations may remain in the surface of the finished materials so long as no loose material remains in the indentations.

H. At the end of each day's work, a construction joint shall be made in thoroughly compacted material and with a vertical face. After a part-width section has been completed, the longitudinal joint against which additional material is to be placed shall be trimmed approximately three inches (3") into treated material, to the neat line of the section, with a vertical edge. The material so trimmed shall be incorporated into the adjacent material to be treated.

I. An acceptable alternate to the above construction joints, if the treatment is performed with cross shaft rotary mixers, is to actually mix three inches (3") into the previous day's work to assure a good bond to the adjacent work.

3.7 FINAL GRADING

A. Finish all lime treated engineered fill grades to within a tolerance of 0.05' of grades shown for top of lime/cement stabilization treatment or as indicated by drawings and specifications.

B. Leave all areas in suitable condition for subsequent work.

C. Excess materials not needed for final grading operations shall be removed from the site.

3.8 CURING

A. The surface of compacted and finish graded lime treated soil shall be kept moist for at least 3 days after final trimming, rolling and compacting. No equipment or traffic shall be permitted on the lime treated material during the 3 day cure, except for the water truck to keep the treated area at or above the optimum moisture. After the 3 day cure apply aggregate base. Maintain moisture curing at optimum level until aggregate base is placed

END OF SECTION 31 32 00

SECTION 32 11 23 AGGREGATE BASE COURSES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Aggregate base course.
2. Paving aggregates.
3. Decomposed Granite

B. Related Sections:
1. Section 31 22 00: Grading.
2. Section 31 23 16.13: Trenching.
3. Section 31 23 23: Fill.
4. Section 32 13 13: Cement Concrete Paving.

C. Related References:
1. Soils Geotechnical Report.

D. Reference Standards:
1. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
2. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop.
3. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
4. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
5. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
6. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)).
7. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
8. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
9. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. Material Source: Submit name of imported material source.

1.4 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

PART 2 PRODUCTS

2.1 MATERIALS

A. Aggregate Type 2 - Coarse aggregate, conforming to Section 26 of the State of California Department of Transportation Standard and Specifications, latest edition:
   1. The aggregate shall be free from vegetable matter and other deleterious substances.
   2. Aggregate shall consist of material of which at least 60 percent by weight shall be crushed particles as determined by test method No. Cali. 205.

B. All decomposed granite shall conform to the following grading requirements:

Sieve Designation	% Passing	Sieve Designation	% Passing
3/8 inch	100	No. 30	40-50
No.4	95-100	No. 50	25-35
No.8	75-80	No. 100	20-25
No.16	55-65	No. 200	5-15

   1. The portion of D.G. retained on the No. 4 sieve shall have a maximum percentage of wear of 50 at 500 revolutions as determined by AASHTO T96.
   2. The portion passing a No. 40 sieve shall have a maximum liquid limit of 25 and maximum plasticity index of 7 as determined by AASHTO T89 and AASHTO T90, respectively.
   3. Crushed aggregate screenings shall be free from clay lumps, vegetative matter and deleterious material, including noxious weed seeds such as nutgrass

C. Coarse Aggregate Type___: AASHTO M 147, Grade_____; passing the No._____sieve; with a liquid limit of not more than 25 and a plasticity index of not more than 5 in accordance with ASTM D4318.

D. Herbicide: As approved.

2.2 SOURCE QUALITY CONTROL

A. See Section 01 40 00: Quality Requirements, for general requirements for testing and analysis of aggregate materials.

B. If tests indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.2 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.3 INSTALLATION

A. Spread aggregate over prepared substrate to a total compacted thickness as shown on the

plans.

B. Place aggregate in maximum 4 inch layers and roller compact to specified density.

C. Compact to 95% of maximum dry density.

D. Level and contour surfaces to elevations and gradients indicated.

E. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

F. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

G. Base shall be firm and unyielding when proof rolled with heavy, rubber-tired grading equipment prior to continuing construction.

H. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

I. Apply herbicide to finished surface.

3.4 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

3.5 FIELD QUALITY CONTROL

A. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.

B. If tests indicate work does not meet specified requirements, remove work, replace and retest.

3.6 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION 32 11 23

SECTION 32 12 00 ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 50 00, Construction Facilities and Temporary Controls.

B. Section 31 00 00, Earthwork.

C. Section 31 23 33, Trenching and Backfilling.

D. Section 32 80 00, Irrigation

E. Section 33 40 00, Site Drainage.

1.3 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

C. The representatives of the Owner’s testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner’s testing lab representatives nor the testing by the Owner’s testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.

D. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.

E. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.

F. Sieve analysis from testing laboratories identifying rock/sand percentages within the asphalt mix shall have a testing date within 90 days of contract signing.

G. Sieve analysis from a testing laboratory identifying rock/sand percentages within the class 2 aggregate base rock shall have a testing date within 90 days of contract signing.

1.4 SUBMITTALS

A. Manufacturer's Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

1.5 WARRANTY

A. Refer to General Conditions.

1.6 REFERENCES AND STANDARDS

A. ANSI/ASTM D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

B. ANSI/ASTM D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ANSI/ASTM D1557-02 - 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.

D. ANSI/ASTM D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).

E. ANSI/ASTM D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

H. Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.

1.7 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

B. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this Section and that arrangements have been made to properly store, handle and protect such materials and work.

1.8 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
   2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.9 EXISTING SITE CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.10 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above

and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.11 SEASONAL LIMITS

A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.12 TESTING

A. General: Refer to Section 01 40 00 – Quality Requirements.

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Sterilant: Soil sterilizer shall be Esplanade 200 SC or approve equal and approved for use in California.
   1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.

B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).

C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturer's.

D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.

E. Surface Course Aggregate: Mineral aggregates for Class "A" asphalt concrete, conforming to State Specifications 39-2.02, ½" maximum, medium gradient. 3/8" maximum gradient at Playcourt.

F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as, or equal to:
1. "Park-Top No. 302", Western Colloid Products.
2. "OverKote", Reed and Gram.
3. "Drivewalk", Conoco Oil.

G. Wood Headers and Stakes: Pressure treated.

H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D 6628.
1. Waterborne traffic line - colors white, yellow and black, State specification PTWB-01R2.
2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.

I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.

J. Pavement Epoxy; K-Lite; Ktepx-590; Ennis Epoxy HPS2 or an approved equal.

K. Crack Filler;
1. Cracks up to ½": QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.
2. Cracks ¼" – 1": "Docal 1100 Viscolastic, distributed by Conoco, Inc., Elk Grove, CA, (916) 685-9253, or approved equal.
3. Cracks greater than 1": Hot Mix, Topeka.

L. Reclaimed Asphalt Paugment (RAP). HMA Class A may be produced using RAP providing it does not exceed 15% of the aggregate blend.

2.2 MIXES

A. General: Plant mixed conforming to State Specifications, Section 39, Class A, ½" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.

B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.

C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.

D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.

E. Temperature of Warm Mix Asphalt: Mixing and placement; Per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION OF CONDITIONS

A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05’ in 10' from true plan. Compact per Section 31 00 00. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

B. Cleaning: Existing surfaces and new surface shall be clean of all dirt, sand, oil or grease. All cracks shall be cleaned and free of all debris and vegetation. Hose down entire area with a strong jet of water to remove all debris.

3.3 INSTALLATION

A. Headers:
1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

B. Asphalt Paving:
1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the project inspector is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
   a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
   a. Comply with State Specifications, 39-6 except as modified below.
      1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover

area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.

2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature. Onsite inspector shall verify temperature of asphalt upon truck arrival to the site.

5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.
7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 6” wide x ½ the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 2, 15 and 16. Apply two coats seal coat to all trench patches.

C. Seal Coat:
1. Apply seal coat to all new asphalt paving surfaces, paved areas or trench patch. Seal coat shall be applied no sooner than 30 days from time of asphalt placement, no exceptions.
2. Surface Preparation: surface and cracks shall be clean of all dirt, sand, oil or grease. All cracks shall be filled to a level condition after curing. Make multiple fill applications until a level condition is achieved. Failure to do so will be the reason for rejection. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted hot mix asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
3. Seal Coat Seal Application: Thoroughly mix materials and apply in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
   a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
   b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.

D. Asphalt Concrete Overlay Paving:
1. Comply with State Specifications, 39-6 except as modified below.
2. Grind or remove existing asphalt concrete paving at limits of overlay paving to provide a minimum 1-1/2" overlay thickness. Limits of grinding or removal shall be field verified to insure that finished paving surface will have a one percent minimum slope.
3. Thoroughly clean surface to remove vegetation, dirt, sand, gravel and water from surface and from cracks. Vegetation shall be treated 7 days prior to removal with an herbicide.
4. Cracks greater than 1 inch shall be filled with hot mix asphalt and rolled and compacted. Cracks less than one inch shall be filled with crack filler. Potholes shall be filled with hot-mix rolled and compacted. Contractor shall have Engineer approve crack and pothole repair prior to overlay. Provide leveling courses of hot mix asphalt

as required to achieve finish grades shown on the drawings.
   a. Cracks less than one inch in width shall be level after curing. Contractor shall make multiple filling applications as necessary to achieve a level condition.
5. Place overlay when ambient air temperature is 40 degrees F. and rising, and when pavement is dry.
6. An asphalt tack coat shall be applied to existing surface area at a rate of 0.20 gallons per square yard. Application width shall be width of fabric plus 2 to 6 inches.
7. Place, spread and compact asphalt overlay to provide a minimum density of 95% of maximum theoretical unit weight as determined by California Test Method #304. Maximum variation 1/8" in 10' when measured with steel straight edge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. Minimum compacted overlay thickness 1 1/2 inches.

E. Pavement Marking: pavement markings shall be done only after the seal coat has thoroughly dried. Existing surfaces to be striped with traffic paint shall be cleaned of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be thoroughly cleaned by whatever means necessary that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playfield markings, etc. on asphalt concrete paving. Paint strips shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
   1. Paints shall be delivered to the site in unopened containers.
      a. Paint shall not be diluted, or watered down.
      b. Paint shall be applied in 10-12 wet mil thickness (4-6 mil dried). Each coat thickness shall be verified by the project inspector.
   2. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to PMS 293C. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

F. Colors: As directed by Architect

G. Precast Concrete Bumpers: Install in location where shown, using steel rebar dowels, and epoxy.

3.4 DEFECTIVE ASPHALT;

Defective asphalt is as described below.

A. Exposed rock pockets on the finished surface that lack the # 8- #200 fines that is required per the sieve analysis.

B. Asphalt not placed to the design grades.

C. Asphalt that ponds water.

D. Asphalt that was compacted below the minimum required temperature and is cracked.

E. Asphalt that fails to meet the minimum compaction requirements.

F. Asphalt that lacks the minimum thickness required per plan.

G. New asphalt contaminated by a petroleum product, or spilled paint.

H. Asphalt that has depressions, cracks, scored divits from dumpster wheels, heavy equipment use, heavy construction products,

I. Asphalt placed on pumping, unstable sub-grades.

3.5 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION 32 12 00

SECTION 32 13 13 CONCRETE PAVING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The Contractor shall furnish all materials for concrete in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished concrete, in accordance with the requirements of the Contract Documents.

B. Provide curb cuts meeting the accessibility requirements of the California Code of Regulations (CCR) Title 24, Part 2, 1127B.5, and ramps complying with CCR, T24, CCR, Part 2, 1003.3.4 and 11B-406.

C. Portland cement concrete paving shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.

D. The following types of concrete shall be covered in this Section:
1. Portland cement concrete pavement, cement walks, flatwork, curbs, gutters, retaining curbs, swales, trash pick-up areas, ramps, mowing strips, fence post footings, sliding gate concrete, catch basins, pipe bedding and encasements, transition structures, flagpoles and light standard bases and footings, splash blocks, parking bumpers and equipment pads.

E. Reference Standards:
1. UU-B-790: Building Paper, Vegetable Fiber (Kraft, Waterproofed, Water Repellant and Fire Resistant).
2. ACI 301: Specifications for Structural Concrete for Buildings.
3. ACI 318: Building Code Requirements for Reinforced Concrete.
4. ASTM C31: Practices for Making and Curing Concrete Test Specimens in the Field.
5. ASTM C33: Specification for Concrete Aggregates.
6. ASTM C39: Test Method for Compressive Strength of Cylindrical Concrete Specimens.
7. ASTM C40: Test Method for Organic Impurities in Fine Aggregates for Concrete.
8. ASTM C42: Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
9. ASTM C78: Specification for Flexural Strength.
10. ASTM C88: Test Method for Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.
11. ASTM C94: Specification for Ready-Mixed Concrete.
12. ASTM C114: Method for Chemical Analysis of Hydraulic Cement.
13. ASTM C131: Test Method for Resistance to Degradation of Small- Sized Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
14. ASTM C136: Method for Sieve Analysis of Fine and Coarse Aggregate.
15. ASTM C143: Test Method for Slump of Portland Cement Concrete.
16. ASTM C150: Specification for Portland Cement.
17. ASTM C156: Test Method for Water Retention by Concrete Curing Materials.
18. ASTM C157: Test Method for Length Change of Hardened Hydraulic Cement Mortar

and Concrete.
19. ASTM C172: Specification for Sampling Fresh Concrete.
20. ASTM C192: Method of Making and Curing Concrete Test Specimens in the Laboratory.
21. ASTM C260: Specification for Air-Entraining Admixtures for Concrete.
22. ASTM C311: Method for Sampling and Testing Fly Ash or Natural Pozzolans for Use as Mineral Admixture in Portland Cement Concrete.
23. ASTM C494: Specification for Chemical Admixtures for Concrete.
24. ASTM C618: Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement.
25. ASTM C979: Specification for Pigments for Integrally Colored Concrete.
26. ASTM C1549: Method for Determination of Solar Reflectance.
27. ASTM D1751: Specification for Performed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
28. ASTM E119: Method for Fire Test of Building Construction and Materials.

1.3 SUBMITTALS

A. Submittals shall be made in accordance with General Requirements.

B. The following submittals and specific information shall be provided:
1. Mix Designs - Prior to beginning the work, the Contractor shall submit to the Engineer, for review, and approval, preliminary concrete mix designs for each class and type of concrete specified herein. The mix designs shall be designed by an independent testing laboratory acceptable to the Engineer. All costs related to such mix design shall be borne by the Contractor:
   a. Each concrete mix submittal shall contain the following information:
      1) Slump on which the design is based.
      2) Total gallons of water per cubic yard.
      3) Brand, type, composition and quantity of cement.
      4) Brand type, composition and quantity of fly ash.
      5) Specific Gravity and gradation of each aggregate.
      6) Ratio of fine to total aggregate per cubic yard.
      7) Weight (surface dry) of each aggregate per cubic yard.
      8) Brand, type, and ASTM designation, active chemical ingredients and quantity of each admixture.
      9) Copy of the Building and Safety Research Report Approval for each concrete admixture.
      10) Air content.
      11) Compressive strength based on 7 day and 28 day compression tests, including standard deviation calculations, corroborative data (if applicable), and required average comprehensive strength per ACI 318, Section 5.
      12) Time of initial set.
      13) Certification stamp and signature by a Civil or Structural engineer registered in state of California.
      14) Certificate of Compliance for Cement.
      15) Test Data: ASTM C1549 Solar Reflectance. Submit test reports of proposed mix certifying solar reflectance meets project requirements.
2. Certified Delivery Tickets: Where ready-mix concrete is used, the Contractor shall provide certified weighmaster delivery tickets at the time of delivery of each load of concrete. Each certificate shall show the public weighmaster's signature, and the total quantities, by weight of cement, sand, each class of aggregate, admixtures, and the amounts of water in the aggregate and added at the batching plant as well as the amount of water allowed to be added at the site for the specific design mix. Each certificate shall, in addition, state the mix number, total yield in cubic yards, and the time of day, to the nearest minute, corresponding to when the batch was dispatched,

when it left the plant, when it arrived at the job, the time that unloading began, and the time that unloading was finished.

3. When a water reducing admixture is to be used, the Contractor shall furnish mix designs for concrete both with and without the admixture.
4. The Contractor shall furnish a Certificate of Compliance signed by the supplier identifying the type of fly ash and stating that the fly ash complies with ASTM C618 and these Specifications, together with all supporting test data prior to the use of the fly ash the sample represents. The supporting data shall also contain test results confirming that the fly ash in combination with the cement and water to be used meets all strength requirements and is compatible with air- entraining agents and other admixtures.
5. The Contractor shall submit to the Engineer for review the design mix for fly ash concrete together with the design mix for portland cement (non-fly ash) concrete as specified in this Section.

1.4 QUALITY ASSURANCE

A. Testing for Portland Cement Concrete shall be sampled and tested in accordance with the ASTM and California Tests listed in the Standard Specifications for Public Works Construction, Current Edition, Section 201-1.1.5.

B. Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs. Additional samples for seven-day compressive strength tests shall be taken for each class of concrete at the beginning of the concrete work or whenever the mix or aggregate is changed.

C. The cost of all laboratory tests on cement, aggregates, and concrete, will be borne by the Contractor.

D. Concrete for testing shall be supplied by the Contractor at no cost to the Owner, and the Contractor shall provide assistance and facilities to the Inspector in obtaining samples, and disposal and cleanup of excess material.

E. Curbs and gutters shall be staked by a Land Surveyor licensed to practice in the State of California.

F. Job Mock-Up:
   1. General:
      a. Make samples on-site; revise as required; obtain Architect's approval, 10 days prior to casting finished work.
      b. Finished work to match approved samples.
      c. Approved sample may be incorporated into the work. Retain samples until completion of all concrete work.
      d. Include typical tooled joint control in sample.
   2. Color Cured Hardened Slab; Interior Slab-On-Grade: Provide sample, 20 s.f. minimum area.
   3. Broom Finished Concrete; Exterior Flatwork: Provide sample, 20 s.f. minimum area.
   4. “Sacked” Vertical Surface; Exterior Wall: Provide sample, 5 sf. minimum area.

G. Construction Tolerances: The Contractor shall set and maintain concrete forms and perform finishing operations so as to ensure that the completed work is within the tolerances specified herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown.

H. Construction tolerances shall not violate dimensions, grades, slopes required by CBC for accessibility requirements. Adjust work accordingly to comply with requirements.

I. The following construction tolerances are hereby established and apply to finished walls and slab unless otherwise shown:

Item	Tolerance
Variation of the constructed linear outline from the established position in plan.	In 10 feet: 1/8-inch; In 20 feet or more: 1/4-inch
Variation from the level or from the grades shown.	In 10 feet: 1/8-inch; In 20 feet or more: 1/4-inch
Variation from the plumb	In 10 feet: 1/8-inch; In 20 feet or more: 1/4-inch
Variation in the thickness of slabs and walls.	Minus 1/8-inch; Plus 1/4-inch
Variation in the locations and sizes of slabs inch and wall openings.	Plus or minus 1/8

PART 2 PRODUCTS

2.1 MATERIALS

A. Materials shall be delivered, stored, and handled so as to prevent damage by water or breakage. Only one brand of cement shall be used. Cement reclaimed from cleaning bags or leaking containers shall not be used. All cement shall be used in the sequence of receipt of shipments.

B. All materials furnished for the work shall comply with the requirements of ACI 301, as applicable.

C. Storage of materials shall conform to the requirements of Section 205 of ACI 301.

D. Form Materials - Plywood, metal, metal-framed plywood, or other acceptable panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces:
   1. Use flexible or curved forms for curves of a 100-foot or less radius.
   2. Wood form material, profiled to suit conditions:
      a. Materials shall be free from defects which would impair the appearance of structural quality of the completed work
      b. Provide stakes and bracing materials as required to hold forms securely in place.

E. Reinforcing Materials:
   1. Steel Reinforcing Bars: ASTM A615/A615M deformed grade 80 (80,000 psi) yield strength billet steel, unfinished, unless otherwise specified on Construction Document. Fabrication, sampling and jobsite handling shall conform to the requirements in ASTM Designation D3963, except the 2 samples shall be 30 inches long.
   2. Steel Welded Wire Reinforcement: Plain type, ASTM A1064/A1064M; in flat sheets; unfinished.
   3. Dowels:
      a. Dowel bars shall be plain round smooth conforming to the requirements in ASTM Designation A615/A615M, Grade 60 (60,000 psi) yield strength, except that the two

samples required in ASTM Designation D3963/D3963M shall be 18 inches long. Dowel bars shall be free from burrs or other deformations detrimental to free movement of the bars in the concrete.

b. Dowel bars shall be lubricated with a bond breaker over the entire bar. A bond breaker application of petroleum paraffin based lubricant or white- pigmented curing compound shall be used to coat the dowel bars completely prior to placement. Oil and asphalt based bond breakers shall not be used. Paraffin based lubricant shall be Dayton Superior DSC BB-Coat or Valvoline Tectyl 506 or an approved equal. Paraffin based lubricant shall be factory applied. White pigmented curing compound shall conform to the requirements of ASTM Designation C309, Type 2, Class A, and shall contain 22 percent minimum nonvolatile vehicles consisting of at least 50 percent paraffin wax. Curing compound shall be applied in 2 separate applications, the last application not more than 8 hours prior to placement of the dowel bars. Each application of curing compound shall be applied at the approximate rate of one gallon per 15 square yards.

4. Epoxy for bonding tie bars and dowel bars to portland cement concrete shall be a two-component, epoxy-resin, conforming to the requirements of ASTM Designation C881, Type V, Grade 3 (Non-Sagging), Class B or C. The class used shall be dependent on the internal temperature of the hardened concrete at the time the epoxy is to be applied. Class B shall be used when the internal temperature is from 40 °F to 60 °F. Class C shall be used when the internal temperature is above 60 °F, but not higher than recommended by the manufacturer. A copy of the manufacturer's recommended installation procedure shall be provided to the Engineer at least 7 days prior to the start of work. Epoxy shall be applied in conformance with the manufacturer's recommendations:
   a. Simpson Strong Tie Set-XP Epoxy (or approved equal) ICC-ES ESR- 2508.

F. Concrete Materials:
1. Provide in accordance with State of CA Highways (CalTrans) standards.
2. Site concrete shall be standard brand portland cement conforming to ASTM C150, 80% Type II or Type V with 15% Class F fly ash. A water-reducing admixture conforming to section 2.01, part G.4 herein must also be used. A single brand of cement shall be used throughout the work, and prior to its use, the brand shall be acceptable to the Engineer. The cement shall be suitably protected from exposure to moisture until used. Cement that has become lumpy shall not be used. Sacked cement shall be stored in such a manner so as to permit access for inspection and sampling. Certified mill test reports for each shipment of cement to be used shall be submitted to the Inspector.
3. Concurrent with strength design criteria, concrete shall also be proportioned to provide the requisite durability to satisfy the exposure conditions imposed by either environment and/or service. Durability, in this context, refers to the ability of the concrete to resist deterioration from the environment or service in which it is placed. Concrete proportioned in accordance with ACI 318, chapter 4, Durability Requirements, will meet this criteria.
4. Combined Aggregate: 1" maximum coarse aggregate size conforming to Grading C of Standard Specifications Section 201-1.3.2(A). Aggregates shall be obtained from pits acceptable to the Inspector, shall be non-reactive, and shall conform to ASTM C33.
5. Water: Shall be potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts and other impurities. The water shall be considered potable, for the purposes of this Section only, if it meets the requirements of the local governmental agencies.
6. **“Pea gravel” mix is not acceptable,** unless specifically approved in writing by the Civil Engineer of Record prior to construction.

G. Admixtures:
1. The Engineer may require the use of admixtures or the Contractor may propose to use

admixtures to control the set, effect water reduction, and increase workability. In either case, the addition of an admixture shall be at the Contractor's expense. The use and continued use of an admixture shall be approved by the Engineer. Admixtures specified herein, other than calcium chloride, shall conform to the requirements of ASTM C494. The required quantity of cement shall be used in the mix regardless of whether or not an admixture is used. Admixtures shall contain no free chloride ions, be non-toxic after 30 days, and shall be compatible with and made by the same manufacturer as the air entraining admixture.

2. These admixtures shall not be used in greater doses than those recommended by the manufacturer or permitted by the Engineer. The permitted dosage of the admixture shall not exceed that which will result in an increase in the driving shrinkage of the concrete in excess of 20 percent when used in precast or prestressed concrete, or 10 percent when used in any other structural concrete. The strength of concrete containing the admixture in the amount of proposed shall, at the age of 48 hours and longer be not less than that of similar concrete without the admixture. The admixture shall not adversely affect the specified air content, unless permitted by the Engineer.
3. Set controlling admixture shall be either with or without water-reducing properties. Where the air temperature at the time of placement is expected to be consistently over 80 degrees F, a set retarding admixture such as [Sika Chemical Corporation's Plastiment], [Master Builder's Pozzolith 300R], or equal shall be used. Where the air temperature at the time of placement is expected to be consistently under 40 degrees F, a set accelerating admixture such as [Sika Chemical Corporation's Plastocrete 161FL], [Master Builder's Pozzolith 50C], or equal shall be used.
4. Low range water reducer shall conform to ASTM C494, Type A. It shall be either a hydroxylated carboxylic acid type or a hydroxylated polymer type. The quantity of admixture used and the method of mixing shall be in accordance with the manufacturer's instructions and recommendations.
5. High range water reducer shall be sulfonated polymer conforming to ASTM C494, Type F or G:
    a. If the high range water reducing agent is added to the concrete at the batch plant, it shall be second generation type, [Daracem 100, as manufactured by W.R. Grace & Co.]; [Pozzolith 430R, as manufactured by Masterbuilders]; or equal. High range water reducer shall be added to the concrete after all other ingredients have been mixed and initial slump has been verified.
    b. If the high range water reducer is added to the concrete at the job site, it shall be used in conjunction with a low range water reducer and shall be [Pozzolith 400N and Pozzolith MBL82, as manufactured by Masterbuilders]; [WRDA 19 and WRDA 79, as manufactured by W.R. Grace & Co.]; or equal. Concrete shall have a slump of 3-inches ± 1/2- inch prior to adding the high range water reducing admixture at the job site. The high range water reducing admixture shall be accurately measured and pressure injected into the mixer as a single dose by an experienced technician. A standby system shall be provided and tested prior to each day's operation of the job site system.
6. Air-entraining agent meeting the requirements of ASTM C260, shall be used. Sufficient air-entraining agent shall be used to provide a total air content of 3 to 4 percent; provided that, when the mean daily temperature in the vicinity of the worksite falls below 40 degrees F for more than one day, the total air content provided shall be 5 to 6 percent. The Owner reserves the right, at any time, to sample and test the air-entraining agent received on the job by the Contractor. The air-entraining agent shall be added to the batch in a portion of the mixing water. The solution shall be batched by means of a mechanical batcher capable of accurate measurement.
7. Calcium Chloride: Except as otherwise provided herein, calcium chloride will not be permitted to be used in concrete.
8. Fly ash/pozzolan shall conform to ASTM C618 and the following supplementary requirements:
    a. Class F Fly Ash:

1) Loss on ignition: maximum 4 percent.
2) S03 content: maximum 3 percent.
3) Moisture content: maximum 1 percent.

b. Class F fly ash, as a percent by weight of total cementitious material, shall not exceed 15 percent.
c. When Sulfate Resistant or Special Exposure Concrete is specified, test results shall be submitted to the Engineer as specified in Section 2-5.3 of the Standard Specifications. The test result shall show that the fly ash to be used is effective in contributing to sulfate resistance in conformance with ASTM C618, Table 3 (optional physical requirements) as tested in accordance with ASTM C1012. The data submitted shall be less than 6 months old.

H. Curing Materials:
1. Concrete curing compound shall conform to the requirements of ASTM C309 Type [1 – clear or translucent without dye] [1D - clear or translucent with a fugitive dye], Class [A – no type restrictions] [B – must be a resin], except the loss of water shall not exceed 0.15 kilograms per square meter in 24 hours nor 0.45 kilograms per square meter in 72 hours when tested in accordance with ASTM C156. The Contractor shall provide, when requested by the Engineer, certified copies of vendor's test report showing compliance with ASTM C309 and these specifications. The testing and the report shall be supplied without cost to the Agency. All compounds shall be furnished by the Contractor in sealed original containers labeled in accordance with ASTM C309 and with the date of manufacture.
2. Polyethylene sheet for use as concrete curing blanket shall be white and conform to ASTM C171. The loss of moisture when determined in accordance with the requirements of ASTM C156 shall not exceed 0.055 grams per square centimeter of surface.
3. Polyethylene-coated burlap for use as concrete curing blanket shall conform to ASTM C171. The loss of moisture, when determined in accordance with the requirements of ASTM C156, shall not exceed 0.055 grams per square centimeter of surface.

I. Expansion Joint Filler Material:
1. Curb & Gutter: Nonextruding and Resilient Filler: Celotex "Flexcell", or approved equal, 1/4-inch thick material conforming to ASTM D1751.
2. Concrete Walk and Slab: Joint filler material shall be preformed expansion joint filler conforming to the requirements of ASTM D994. A Certificate of Compliance for the joint filler material shall be furnished to the Engineer. The certificate shall be accompanied with a certified test report of the results of the required tests performed on the joint filler material within the previous 12 months prior to proposed use. The certificate and accompanying test report shall be provided for each lot of joint filler material prior to use on the project.
3. Silicone Joint Sealant - Premium-grade, high-performance, moisture-cured, single-component, polyurethane-based, non-sag elastomeric sealant. Meets Federal specification TT-S-00230C. Meets ASTM C920, Type S, Class 25 or 35; Grade NS, Use T or NT, Shore A Hardness (21 day) 35-45. A Certificate of Compliance for the silicone sealant shall be furnished to the Engineer. The Certificate shall also be accompanied with a certified test report of the results of the required tests performed on the sealant material within the previous 12 months prior to proposed use. The Certificate and accompanying test report shall be provided for each lot of silicone joint sealant prior to use on the project:
   a. Sika Corporation, Sikaflex-1A.
   b. Tremco, Inc., Dymonic.
   c. Tremco, Inc., Vulkem 116.
   d. Bostik Construction Products Div., Chem-Calk 900.

J. Concrete Sealer: For natural color concrete only, HLQ-125 as manufactured by SINAK

Corp., San Diego, CA (619/231-1771), HLQ-125 as manufactured by SINAK Corp., San Diego, CA (619/231-1771), or equivalent product of another manufacturer in accordance with the "or equal" provision of the Contract Documents, penetrating sealer that interacts with mineral compounds and siliceous materials in portland cement concrete to produce more dense, non-dusting surface.

K. Related Materials:
1. Damp-proofing agent shall be an asphalt emulsion, such as [Sonneborn Hydrocide 660], [Flintkote C-13-E Foundation Coating], or equal.
2. Epoxy adhesives shall be the following products for the applications specified:
   a. For bonding freshly-mixed, plastic concrete to hardened concrete, [Sikadur Hi-Mod Epoxy Adhesive, as manufactured by Sika Chemical Corporation]; [Concresive 1001-LPL, as manufactured by Adhesive Engineering Company]; or equal.
   b. For bonding hardened concrete or masonry to steel, [Colma-Dur Gel], [Sikadur Hi-Mod Gel], or equal.

2.2 CONCRETE MIX DESIGN

A. Concrete Mix Design In Heavy Duty Areas - At a minimum, site concrete in heavy duty areas (as noted on grading plan) shall conform to the Standard Specifications for Public Works Construction, Section 201-1.1.2, mix class 650-CLE-4000P:
1. Compressive Strength: Minimum of 4,000 psi at 28 days compressive strength.
2. Slump Limit: 4 inches at point of placement.
3. Cement per cu yard (sacks): 6.9 (minimum).
4. Air Content: 4% +/- 1% percent.
5. Verifiable Solar Reflectance: 0.30 (ASTM C1549).

B. Concrete Mix Design In Light Duty Areas - At a minimum, site concrete in light duty areas (as noted on grading plan) shall conform to the Standard Specifications for Public Works Construction, Section 201-1.1.2, mix class 520-C-2500:
1. Compressive Strength: Minimum of 2,500 psi at 28 days compressive strength.
2. Slump Limit: 4 inches at point of placement.
3. Cement per cu yard (sacks): 5.5 (minimum).
4. Air Content: 4% +/- 1% percent.
5. Verifiable Solar Reflectance: 0.30 (ASTM C1549)

C. Slurry Mix Design:
1. Compressive Strength: 100 psi at min. 28 days compressive strength.
2. Slump Limit: 5 inches at point of placement.
3. Cement per cu yard (sacks): 1.0
4. Aggregate Gradation: “E” per S.S.P.W.C. table 201-1.3.2(A).
5. Air Content: 4% +/- 1% percent.

PART 3 EXECUTION

3.1 PREPARATION OF SURFACES FOR CONCRETING

A. General: Earth surfaces shall be thoroughly wetted by sprinkling, prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. The surface shall be free from standing water, mud, and debris at the time of placing concrete.

B. Aggregate base material shall be installed in layers not exceeding 4-inches and compacted to a minimum of 95% relative density.

C. Subgrade Preparation:
   1. It is required that the native soil, and/or imported fill material, below the new aggregate base, be over excavated to the recommended minimum depth of 24 inches. Refer to section 13.2.2 of the soils report for recompaction requirements. The extent and depths of removal should be evaluated by Geotechnical representative in the field based on the materials exposed. Additional removals may be recommended if loose or soft soils are exposed during grading.
   2. Prior to placement of engineered fill, the subgrade shall be scarified to a depth of at least 8 inches, moisture conditioned and recompacted to a minimum 90% relative density.

D. The compacted surface shall be firm, hard and unyielding. The term "firm, hard and unyielding" as used in S.S.P.W.C. Section 301-1.3 shall mean that when the heaviest construction and hauling equipment used on the project drives over the subgrade, no permanent deformation shall occur either before or during pavement construction. On areas where the underlying material appears to be wet or soft, or where it deflects under wheel loads, the Contractor shall employ excavation and work techniques which do not worsen the subgrade condition.

E. The above subgrade preparation recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. For this reason, the actual over-excavation depths will have to be determined on the basis of in-grading observations and testing performed by representatives of the project geotechnical consultant.

F. A California Licensed Surveyor (LS) must provide grade stakes and elevations for the Geotechnical Engineer to verify that any over-excavation depths, shown on the construction drawings for concrete pavement structural sections, have been achieved prior to re-compaction.

G. Joints in Concrete: Concrete surfaces upon or against which concrete is to be placed, where the placement of the old concrete has been stopped or interrupted so that, as determined by the Engineer, the new concrete cannot be incorporated integrally with that previously placed, are defined as construction joints. The surfaces of horizontal joints shall be given a compacted, roughened surface for good bond. Except where the Drawings call for joint surfaces to be coated, the joint surfaces shall be cleaned of all laitance, loose or defective concrete, and foreign material. Such cleaning shall be accomplished by sandblasting followed by thorough washing. All pools of water shall be removed from the surface of construction joints before the new concrete is placed.

H. Embedded Items: No concrete shall be placed until all formwork, installation of parts to be embedded, reinforcement steel, and preparation of surfaces involved in the placing have been completed and accepted by the Inspector at least 24 hours before placement of concrete. All surfaces of forms and embedded items that have become encrusted with dried grout from concrete previously placed shall be cleaned of all such grout before the surrounding or adjacent concrete is placed.

I. All inserts or other embedded items shall conform to the requirements herein.

J. All reinforcement, anchor bolts, sleeves, inserts, and similar items shall be set and secured in the forms where shown or by shop drawings and shall be acceptable to the Inspector before any concrete is placed. Accuracy of placement is the responsibility of the Contractor.

K. Where concrete is to be cast against old concrete, (greater than 60 days of age), the surface of the old concrete shall be thoroughly cleaned and roughened by sand-blasting,

exposing the aggregate. In concrete shear-walls, suspended slabs and roof slabs, the interface surface at construction joints shall be roughened to a full amplitude of one quarter inch. The hardened surface shall be cleaned of all latent foreign material and washed clean, prior to the application of an epoxy bonding agent.

L. No concrete shall be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes, or other means, and carried out of the forms, clear of the work. No concrete shall be deposited underwater nor shall the Contractor allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such manner and at such velocity as will injure the surface finish of the concrete. Pumping or other necessary dewatering operations for removing ground water, if required, will be subject to the review of the Engineer.

M. Corrosion Protection: Pipe, conduit, dowels, and other ferrous items required to be embedded in concrete construction shall be so positioned and supported prior to placement of concrete that there will be a minimum of 2-inches clearance between said items and any part of the concrete reinforcement. Securing such items in position by wiring or welding them to the reinforcement will not be permitted.

N. Openings for pipes, inserts for pipe hangers and brackets, and the setting of anchors shall, where practicable, be provided for during the placing of concrete.

O. Anchor bolts shall be accurately set, and shall be maintained in position by templates while being embedded in concrete.

P. Cleaning: The surfaces of all metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed.

3.2 HANDLING, TRANSPORTING, AND PLACING

A. General: Placing of concrete shall conform to the applicable requirements of ACI 301 and the requirements of this Section.

B. The total elapsed time between the addition of water at the batch plant and the completion of the discharge of the concrete from the mixer shall not exceed 90 minutes. All concrete remaining in the mixer after said 90-minute time limit shall be rejected and removed from the project site.

C. Non-Conforming Work or Materials: Concrete which upon or before placing is found not to conform to the requirements specified herein shall be rejected and immediately removed from the work. Concrete which is not placed in accordance with these Specifications, or which is of inferior quality, shall be removed and replaced by and at the expense of the Contractor.

D. Whenever batch trucks or other paving equipment cause rutting of the subgrade or subbase in concrete placement areas, inspectors shall immediately stop construction. Construction shall not be allowed to resume until distorted subgrade or subbase is repaired. Contractors and inspectors should locate by proof rolling, any questionable unstable areas in advance to avoid distortion under equipment. Wet, unstable areas must be dried out or replaced before starting placement of asphalt. Locating wet or soft areas in advance can be accomplished by testing finished subgrade or subbase with a loaded truck. Construction of concrete pavement should not proceed unless testing gives a reasonable indication that distortions will not occur during construction of overlying pavement. When repair, aeration, and

recompaction are required to correct damage from Contractor's operation, all necessary repair will be done at Contractor's expense. However, if the Engineer determines that additional depth of aeration and recompaction are needed, that should be paid by change order.

E. All pull boxes, meter boxes, valve covers and manholes shall be adjusted to proposed finish grade prior to placement of the concrete.

F. Dowel Placement:
1. Dowel bars shall be centered on the joint within a tolerance of ±2 inches in the longitudinal direction directly over the contact joint or sawcut for the transverse weakened plane joints, as shown on the plans. Prior to placement of dowel bars, the Contractor shall submit to the Engineer a written procedure to identify the transverse weakened plane joint locations relative to the middle of the dowel bars and the procedure for consolidating concrete around the dowel bars.
2. Dowel bars shall be placed at longitudinal joints as shown on the plans. Dowel bars shall be placed as shown on the plans by using mechanical insertion. When dowel bars are placed by mechanical insertion, the concrete over the dowel bars shall be reworked and refinished so that there is no evidence on the surface of the completed pavement that there has been any insertion performed. When drill and bonding of dowel bars is performed at contact joints, a grout retention ring shall be used.

G. Concrete shall not be placed until the forms and reinforcement have been inspected, all preparations for the placement have been completed, and the preparations have been checked by the project inspector, all subject to the observation of the engineer or architect.

H. Casting New Concrete Against Old: An approved epoxy adhesive bonding agent shall be applied to the old surfaces according to the manufacturer's written recommendations. This provision shall not apply to joints where waterstop is installed.

I. Conveyor Belts and Chutes: All ends of chutes, hopper gates, and all other points of concrete discharge throughout the Contractor's conveying, hoisting and placing system shall be so designed and arranged that concrete passing from them will not fall separated into whatever receptacle immediately receives it. Conveyor belts, if used, shall be of a type acceptable to the Inspector. Chutes longer than 50 feet will not be permitted. Minimum slopes of chutes shall be such that concrete of the specified consistency will readily flow in them. If a conveyor belt is used, it shall be wiped clean by a device operated in such a manner that none of the mortar adhering to the belt will be wasted. All conveyor belts and chutes shall be covered. Sufficient illumination shall be provided in the interior of all forms so that the concrete at the places of deposit is visible from the deck or runway.

J. Placement in Slabs: Concrete placed in sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the pour. As the work progresses, the concrete shall be vibrated and carefully worked around the slab reinforcement, and the surface of the slab shall be screeded in an up-slope direction.

K. Temperature of Concrete: The temperature of concrete when it is being placed shall be not more than 90 degrees F nor less than 40 degrees F in moderate weather, and not less than 50 degrees F in weather during which the mean daily temperature drops below 40 degrees F. Concrete ingredients shall not be heated to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, from falling below the specified minimum temperature. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90 degrees F, the Contractor shall employ effective means, such as precooling of aggregates and mixing water using ice or placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90 degrees F. The Contractor shall be entitled to no additional compensation on account of the foregoing

requirements.

L. Cold Weather Placement: Earth foundations shall be free from frost or ice when concrete is placed upon or against them. Fly ash concrete shall not be placed when the air temperature falls below 50 degrees F.

M. A transverse construction joint shall be constructed, including dowel bars, at the end of each day's work or where concrete placement is interrupted for more than 30 minutes, to coincide with the next contraction joint location. If sufficient concrete has not been mixed to form a slab to match the next contraction joint, when an interruption occurs, the excess concrete shall be removed and disposed of back to the last preceding joint. The cost of removing and disposing of excess concrete shall be at the Contractor's expense. Excess material shall become the property of the Contractor and shall be disposed of. A metal or wooden bulkhead (header) shall be used to form the joint. The bulkhead shall be designed to accommodate the installation of dowel bars.

N. Broom Finish Type:
1. Surfaces Sloped Less than 6%: Provide a medium salt (medium broom) finish by drawing a soft bristle broom across concrete surface, perpendicular to line of traffic, to provide a uniform fine line texture.
2. Surfaces Sloped greater than 6%: Provide a slip resistant (heavy broom finish) by striating surface 1/16 inch to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.
3. Joints in concrete curb, gutter, and walk shall be designated as expansion joints and control joints. Joints for concrete flatwork shall be provided every eight (8) feet or less. Expansion joints for swales, curbs / curb & gutter shall be placed at no greater than 24 feet on center or as indicated on construction drawings:
    a. Expansion Joints - Provide 1/2” premolded joint filler, material meeting Section 2.01I herein. Construct expansion joints in conformance with Standard Specification Section 303-5.4.2 and the details on the construction documents:
        1) Extend expansion joint fillers full-width and depth of joint, and 1/4" below finished surface where joint filler is indicated. If no joint sealer is called for, place top of premolded joint filler flush with top of concrete or curb.
        2) Where silicone joint sealer is noted on the construction documents, the premolded joint filler strips shall be placed 1” below the surface of the concrete or curb, the full width of the expansion joint. The remainder of all joints shall be filled to within 1/4” below the surface of the concrete with the silicone joint sealant.
        3) Provide expansion joint filler strips, with elastomeric sealer, between p.c.c. walk and curb, p.c.c. walk and buildings, & p.c.c. walk and retaining walls and at locations noted on the construction documents. The depth of the filler strip shall be the depth of the p.c.c. walk plus 1 inch with the top set flush with the specified grade of the top of curb or walk.
    b. Control Joints:
        1) Control joints in site work concrete shall comply with Standard Specification Section 302-6.5.4, except that the configuration of the joint, shall be as indicated on the construction documents.
        2) Control joints in concrete curbs, sidewalks and gutters shall comply with Standard Specification Section 303-5.4.3, except that the joint configuration shall be as indicated below.
        3) Location: As shown on construction documents, but in any case not more than eight (8) feet O.C. both ways in concrete sidewalks. In swales and gutters, including gutter integral with curb, joints shall be at regular intervals not exceeding five (5) feet. Where integral curb and gutter is adjacent to concrete pavement, the joint shall be aligned with the pavement joints where practical.

O. Protection: In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control film. Apply according to manufacturer's instructions after screeding and bull floating, but before floating.

3.3 TAMPING AND VIBRATING

A. As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted, throughout the entire depth of the layer which is being consolidated, into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement. Vibrators shall be high speed power vibrators (8000 to 10,000 rpm) of an immersion type in sufficient number and with (at least one) standby units as required.

B. Care shall be used in placing concrete around waterstops. The concrete shall be carefully worked by rodding and vibrating to make sure that all air and rock pockets have been eliminated. Where flat-strip type waterstops are placed horizontally, the concrete shall be worked under the waterstops by hand, making sure that all air and rock pockets have been eliminated. Concrete surrounding the waterstops shall be given additional vibration, over and above that used for adjacent concrete placement to assure complete embedment of the waterstops in the concrete.

C. Concrete in walls shall be internally vibrated and at the same time rammed, stirred, or worked with suitable appliances, tamping bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against all surfaces. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified. Vibrators shall be provided in sufficient numbers, with standby units as required, to accomplish the results herein specified within 15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall be kept from contact with the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it in any manner that causes segregation of its constituents.

3.4 CURING

A. Comply with 2022 California Building Code, Title 24, Part 2, Volume 2, Section 1905A.11:
   1. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least seven (7) days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

B. Curing Methods - Perform curing of concrete by curing as herein specified:
   1. Provide moisture-curing by the following methods:
      a. Keep concrete surface continuously wet by covering with water.
      b. Continuous water-fog spray.
      c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4 inch lap over adjacent absorptive covers.
   2. Provide curing and sealing compound to exposed exterior slabs, walks, and curbs, as follows:
      a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Re-coat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
      b. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid, floor hardener, waterproofing,

dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

C. Concrete slabs and paving shall be properly cured and protected against damage and defacement of nature during construction operations. If weather is hot or surface has dried out, spray surface with fine mist of water starting not later than two hours after final troweling. Surface of finish shall be kept continuously wet for at least ten days. Wetting is considered emergency work and shall be performed on weekends and holidays if necessary.

D. Concrete Sealer Application - Apply specified concrete sealer in continuous operation in accordance with manufacturer's instructions and recommendations:
   1. Prior to starting application, protect adjoining Work, including sealant bond surfaces, from spillage or blow-over of concrete sealer:
      a. Cover adjoining and nearby surfaces of aluminum and glass where there is the possibility of the concrete sealer being deposited on surfaces.
      b. Cover live plants and grass.
      c. Immediately clean concrete sealer from adjoining surfaces, complying with manufacturer's cleaning recommendations.
   2. Apply concrete sealer under temperature conditions according to manufacturer's instructions.
   3. Apply concrete sealer in light, even coats using garden sprayer, airless sprayer or paint brush.
   4. Apply concrete sealer at rate to suit porosity of portland cement concrete but not less than no more than coverage rates recommended by manufacturer for effective sealing of surface.

E. The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the Contractor's expense. Exclude traffic from concrete paving for at least 7 days after placement.

F. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep concrete paving not more than 2 days prior to date scheduled for Substantial Completion inspections.

3.5 PUMPING OF CONCRETE

A. General: If the pumped concrete does not produce satisfactory end results, the Contractor shall discontinue the pumping operation and proceed with the placing of concrete using conventional methods.

B. Pumping Equipment: The pumping equipment must have 2 cylinders and be designed to operate with one cylinder only in case the other one is not functioning. In lieu of this requirement, the Contractor may have a standby pump on the site during pumping.

C. The minimum diameter of the hose (conduits) shall be 4-inches.

D. Pumping equipment and hoses (conduits) that are not functioning properly, shall be

replaced.

E. Aluminum conduits for conveying the concrete will not be permitted.

F. Proportioning: Minimum compressive strength, cement content, and maximum size of aggregates shall be as specified herein.

G. Gradation of coarse aggregates shall conform to ASTM C33 and shall be as close to the middle range as possible.

H. Gradation of fine aggregate shall conform to ASTM C33, with 15 to 30 percent passing the number 50 screen and 5 to 10 percent passing the number 100 screen. The fineness modulus of sand used shall not be over 3.00.

I. Water and slump requirements shall conform to the requirements of this Section.

J. Cement and admixtures shall conform to the requirements of this Section.

K. Field Control: Concrete samples for slump per ASTM C143 and test cylinders per ASTM C31 and C39.

3.6 TREATMENT OF SURFACE DEFECTS

A. As soon as forms are removed, all exposed surfaces shall be carefully examined and any irregularities shall be immediately rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surfaces to be smoothed will not be permitted. No repairs shall be made until after inspection by the Engineer. In no case will extensive patching of honeycombed concrete be permitted. Concrete containing minor voids, holes, honeycombing, or similar depression defects shall have them repaired as specified herein. Concrete containing extensive voids, holes, honeycombing, or similar depression defects, shall be completely removed and replaced:
   1. All repairs and replacements herein specified shall be promptly executed by the Contractor at its own expense.

B. Defective surfaces to be repaired shall be cut back from trueline a minimum depth of 1/2-inch over the entire area. Feathered edges will not be permitted. Where chipping or cutting tools are not required in order to deepen the area properly, the surface shall be prepared for bonding by the removal of all laitance or soft material, and not less than 1/32-inch depth of the surface film from all hard portions, by means of an efficient sandblast. After cutting and sandblasting, the surface shall be wetted sufficiently in advance of shooting with shotcrete or with cement mortar so that while the repair material is being applied, the surfaces under repair will remain moist, but not so wet as to overcome the suction upon which a good bond depends. The material used for repair purposes shall consist of a mixture of one sack of cement to 3 cubic feet of sand. For exposed walls, the cement shall contain such a proportion of Atlas white portland cement as is required to make the color of the patch match the color of the surrounding concrete.

C. Holes left by tie-rod cones shall be reamed so as to leave the surfaces of the holes clean and rough. These holes then shall be repaired in an approved manner with non-shrink grout. Holes left by form-tying devices having a rectangular cross-section, and other imperfections having a depth greater than their least surface dimension, shall not be reamed but shall be repaired in an approved manner with non-shrink grout.

D. All repairs shall be built up and shaped in such a manner that the completed work will conform to the requirements of this Section, as applicable, using approved methods which

will not disturb the bond, cause sagging, or cause horizontal fractures. Surfaces of said repairs shall receive the same kind and amount of curing treatment as required for the concrete in the repaired section.

E. Prior to filling any structure with water, all cracks that may have developed shall be repaired to the satisfaction of the Engineer. This repair method shall be done on the water bearing face of members. Prior to backfilling, faces of members in contact with fill, which are not covered with a waterproofing membrane, shall also have cracks repaired as specified herein.

F. The finished surface shall be free from humps, sags, blemishes or other irregularities.

3.7 FIELD QUALITY CONTROL

A. Correction of Mix Design for Failed Concrete Tests: If the compressive cylinder strength test for in place PCC yields test results below the specified 28-day PCC compressive strength and the Engineer determines a corrective change is necessary, the Contractor shall, at its own expense, make corrective changes in the mix proportions. The Engineer shall approve the changes in the mix proportions or PCC placement procedures, before any additional PCC is placed on the job.

B. Flood Tests: Before final acceptance, and after concrete has thoroughly cured, all concrete pavement, including swales and curb & gutter, shall be water tested to ensure proper drainage as directed by the Inspector. The Contractor shall provide water for this purpose. The flooding shall be done by water tank truck. Concrete work where water ponds and does not run off in a reasonable amount of time (1-hour), shall be removed to the nearest score or joint line and replaced to provide proper drainage. Full compensation for complying with this requirement shall be considered as included in the Contract Unit Price for cement concrete pavement.

3.8 CARE AND REPAIR OF CONCRETE

A. General: The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the Contractor's expense.

B. The contractor shall barricade and protect placed Portland Cement Concrete from all damage, marks, mars and/or graffiti. Any Portland Cement Concrete damaged, defaced, discolored or defective shall be replaced at the contractor’s expense.

END OF SECTION 32 13 13

SECTION 32 16 00 SITE CONCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. The Section describes the requirements for providing portland cement concrete paving, including accessibility ramps, sidewalks, accessible routes of travel, vehicular travel, drain structures, sewer structures, thrust blocks and for other non-structural or non-vehicular applications.

1.2 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 45 23, Testing and Inspecting Services.

B. Section 31 00 00, Earthwork.

1.4 QUALITY ASSURANCE

A. Use only new materials and products.

B. Use materials and products of one manufacturer whenever possible.

C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

D. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current project name and project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted

1.5 SUBMITTALS

A. Manufacturer's Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

B. Materials list: Submit to the Architect a complete list of all materials proposed to be used in this portion of the work. Submitted items should include but are not limited to sand, gravel, admixtures, surface treatments, coloring agents, sealers, fibers, cast-in-place accessories, forming and curing products and concrete mix designs.

C. With concrete submittal, provide documented history of mix design performance.

1.6 WARRANTY

A. Refer to General Conditions and Section 01 78 36.

1.7 REFERENCES AND STANDARDS

A. California Building Code, latest edition.

B. ACI Standards, ACI 301-20.

C. ASTM C-94, Specification for Ready-Mixed Concrete.

D. Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice (latest edition).

E. ASTM – American Society for Testing and Materials.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.

C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

D. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this Section and that arrangements have been made to properly store, handle and protect such materials and work.

E. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.

F. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 TESTING

A. General: Refer to Section 01 40 00 – Quality Requirements.

1.10 ADEQUACY AND INSPECTION

A. Design, erect, support, brace and maintain formwork and shoring to safely support all vertical and lateral loads that might be applied until such loads can be carried by concrete.

B. Notify Inspector, Architect and DSA at least 48 hours prior to placing of concrete.

1.11 PROTECTION

A. Finish surfaces shall be protected at all times from concrete pour. Inspect forming against such work and establish tight leak-proof seal before concrete is poured. Finish work damaged, defaced or vandalized during the course of construction shall be replaced by contractor at contractor expense.

1.12 FIELD MEASUREMENTS

A. Make and be responsible for all field dimensions necessary for proper fitting, slopes and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement: Portland cement, ASTM C150, Type II, per ACI 301-20.

B. Concrete Aggregates: Normal weight aggregates shall conform to ASTM C33, except as modified by this section. Combined grading shall meet limits of ASTM C33. Lightweight aggregate shall conform to ASTM C330, suitably processed, washed and screened, and shall consist of durable particles without adherent coatings.

C. Water: Clean and free from deleterious amounts of acids, alkalis, scale, or organic materials and per ACI 301-20.

D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials (Class C is not permitted). Not more than 15% (by mass) may be substituted for portland cement.

E. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio, and ultimate shrinkage may be used. Provide WRDA 64 by Grace Construction Products or approved equal. Such admixture must receive prior approval and shall be included in original design mix.

F. Air-entraining Admixture: Daravair 1000 by Grace Construction Products or approved equal.

G. Surface Retarder (for exposed aggregate finishes): Rugasol-S by Sika Corporation or approved equal.

H. Form Coating: Material which will leave no residue on concrete surface that will interfere with surface coating, as approved by the Architect.

I. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615 or ASTM A706; Grade 60. Dowels for installation through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or shall be sleeved on one end for slippage.

J. Reinforcing supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3’-0” O.C.E.W. Staggered and each support securely fastened to steel reinforcement in place. Bottom bars in footings may be supported with 3” concrete blocks with embedded wire ties. Concrete supports without wire ties will not be allowed.

H. Truncated Domes: Vitrified Polymer Composite (VPC), Cast-In-Place Detectable/Tactile Warning Surface Tiles; “Armor-Tile”, “Access Tile Tactile Systems”, or approved equal. Tiles shall comply with Americans with Disabilities Act and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B (dome spacing shall be 2.35”). Install tiles as recommended by manufacturer. Detectable warning surface shall be yellow and approximate 33538 of SAE AMS-STD-595A.

K. Curing Compound (for exterior slabs only): Burke Aqua Resin Cure by Burke by Edoco, 1100 Clear by W.R. Meadows or accepted equal.

L. Concrete Bonding Agent: Weld-Crete by Larson Products Corp., Daraweld C by Grace Construction Products or accepted equal.

M. Patching Mortar: Meadow-Crete GPS, one-component, trowel applied, polymer enhanced, shrinkage-compensated, fiber reinforced, cementitious repair mortar for horizontal, vertical and overhead applications as manufactured by W.R. Meadows or accepted equal.

N. Non-shrink Grout: Masterflow 713 Plus by Master Builders or approved equal. Premixed,non-metallic, no chlorides, non-staining and non-shrinking per CRD-C621, Corps of Engineers Specification and ASTM C 1107, Grades B and C.

O. Aggregate Base: Class 2 AB per Caltrans specification section 26-1.02A.

P. Expansion Joint Material: Preformed 3/8" fiber material, full depth of concrete section, with bituminous binder manufactured for use as concrete expansion joint material, as accepted by the Architect.

Q. Joint sealant for expansion joints: Single component silicone sealant, Type S, ASTM D5893.
1. Reference Standard: ASTM C920, Grade P, Class 25, Use T.
2. Dow Corning 890-SL (self-leveling) Silicone, or accepted equal.
3. Dow Corning 888-NS (non-sagging) Silicone, at slopes exceeding 5%. May not be used at asphalt surfaces.
4. Color: Custom color as selected by Architect.

R. Pre- Formed plastic Expansion Joint; W.R. Meadows 3/8” “Snap Cap”, Tex-Trude expansion joint cap, or an approved equal.

S. Adhesive Anchoring (Epoxy): Simpson SET-XP, or approved equal.

2.2 CONCRETE DESIGN AND CLASS

A. Class “B”: Concrete shall have 1" max. size aggregate, shall have 3000 psi min. at 28 day strength with a maximum water to cementitious ratio no greater than 0.50. Use for exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb & gutter and other concrete of like nature.

B. Slump Limits: Provide concrete, at point of final discharge, of proper consistency determined by Test Method ASTM C143 with a slumps of 4" plus or minus 1".

C. Mix Design: All concrete used in this work will be designed for strength in accordance with provisions of ACI 301-20. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review. Fly ash may be used in concrete to improve workability in amounts up to 15% of the total cementitious weight.

D. Air Entrainment; Per the Local Jurisdiction minimum requirements, or 3% minimum.

2.3 MIXING OF CONCRETE

A. Conform to requirements of CBC, Chapter 19A.

B. All concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.

C. Concrete shall be Ready-mixed Concrete.
1. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
2. Water may be added to the mix only if neither the maximum permissible water-

cement ratio nor the maximum slump is exceeded. In no case shall more than 10 gallons of water shall be added to a full 9 yard load, or 1 gal. per yard on remaining concrete within the drum providing load tag indicates at time of mixing at plant will allow for additional water.

2.4 MATERIALS TESTING

A. Testing of concrete shall be performed per article 3.12 of this specification.

2.5 EQUIPMENT

A. Handling and mixing of concrete: Project Inspector may order removal of any equipment which in his opinion is insufficient or in any way unsuitable.

PART 3 - EXECUTION

3.1 APPROVAL OF FORMS AND REINFORCEMENTS

A. Forms and reinforcements are subject to approval by the Project Inspector, and notice of readiness to place first pour shall be given 48 hours prior to placement of concrete. Before placing concrete, clean tools, equipment and remove all debris from areas to receive concrete. Clean all reinforcing and other embedded items off all coatings oil, and mud that may impair bond with concrete.

B. All reinforcing steel and shall be adequately supported by approved devices on centers close enough to prevent any sagging.

C. All reinforcing bar lap splices shall be staggered a minimum of 5 ft.

D. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
   1. The bars shall be placed so that there will be a minimum of 1 ½” clearance and a maximum of 3” clearance. The reinforcing steel shall be placed mid-depth of concrete slab.

E. At all right angles or intersections of concrete walks, additional 2’x2’ #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2” from concrete forms and supports at mid-depth of slab.

3.2 PROTECTION

A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

C. Sub-Grade in vehicular concrete paved areas: Subgrade shall be clean, shaped and compact to hard surface free from elevations or depressions exceeding 0.05’ in 10' from true plan. Compact per Section 31 00 00. Compaction and moisture content shall be verified immediately prior to placement of concrete. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 CLEANING

A. Reinforcement and all other embedded items at time of placing concrete to be free of rust, dirt oil or any other coatings that would impair bond to concrete.

B. Remove all wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.

3.4 FORMING

A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.

B. Build forms to shapes, lines, grades and dimensions indicated. Construct form work to maintain tolerances required by ACI 301-20. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.

C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.

E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.

F. Slope tie-wires downward to outside of wall.

G. Brace, anchor and support all cast-in items to prevent displacement or distortion.

H. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.

I. Concrete paving, Curbs, Curb and Gutters, Ramps:
   1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20’ for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for backer rod and sealant where required. Expansion joints shall not exceed ¼ inch depth measured from finish surface to top of felt or sealant, and ½ inch width.
   2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60’ on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for backer rod and sealant will be required.
   3. Isolation Joints: 3/8” felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
   4. Exterior Concrete Paving: Install expansion joints at 20’ on center maximum, both directions, unless shown otherwise on plans.
   5. Ramps; whether shown or not all ramps shall have control joints and expansion joints.
      a. Control joints on ramps shall be aligned and be placed in between with the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
      b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.

3.5 FORM COATING

A. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.

B. Before re-using form material, inspect, clean thoroughly and recoat.

C. Seal all cut edges.

3.6 INSTALLATION

A. General: Reinforcement shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC. Keep a person on the job to maintain position of reinforcing as concrete is placed. Reinforcement must be in place before concreting is begun. Install dowels as shown on drawings. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences. All expansion and construction joints in concrete shall have dowels of size and spacing as shown, or as approved by Architect.

B. Placing Tolerances:
   1. Per ACI 301-20 recommended practice for placing reinforcing bars, unless otherwise shown.

C. Splices:
   1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports and stagger splices at adjacent splices 5 foot minimum. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
      a. Lap splices in concrete: Lap splice lengths shall not be less than 62 bar diameter for No. 5 bar, 56” minimum for No. 6 bars. No. 4 bar shall have a minimum of 24” splice.
      b. All splices shall be staggered at 5 feet minimum.

3.7 INSPECTION

A. Slope of concrete forms and finish condition shall be checked with a two foot (2’) digital level.

3.8 PLACING OF CONCRETE

A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to the owner.

B. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.

C. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent

forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area.

D. Remove form spreaders as placing of concrete progresses.

E. Place footings as monolithic and in one continuous pour.

F. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.

G. Compacting: All concrete shall be compacted by mechanical vibrators. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms. Vibrating shall not be applied to concrete which has already begun to initially set nor shall it be continued so long as to cause segregation of materials.

H. Concrete Flatwork:
1. All flatwork shall be formed and finished to required line and grades. Flatwork shall be true and flat with a maximum tolerance of 1/8" in 10’ for flatness. Flatwork which is not flat and are outside of the maximum specified tolerances shall be made level by the Contractor at no additional expense to the Owner.
2. Thoroughly water and soak the flatwork subgrade as required to achieve required moisture content prior to the concrete pour. Provide damming as required to keep water within the formed area and to allow for proper saturation of the subgrade.
3. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.

I. Placing in hot weather: Comply with ACI 305R-10. Concrete shall not exceed 95 degrees F at time of placement. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.

J. Placing in cold weather: Comply with ACI 306R-16. Protect from frost or freezing. No antifreeze admixtures are permitted. When deposited concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

K. Horizontal construction joint: Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.9 CONCRETE FINISHES

A. Concrete Finishing: Surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8" in 10'. Provide final finish as follows:
1. Flatwork and Curbs medium broom finish: Typical finish to be used at all exterior walks and stairs.
2. Ramps, heavy broom finish: Concrete surfaces with slope greater than 5% including all ramps. Brooming direction shall run perpendicular to slope to form non-slip surface
3. Under no circumstances can water be added to the top surface of freshly placed

concrete.

B. Seat Walls: Steel trowel.

C. Joints and Edges: Mark-off exposed joints, where indicated, with ¼" radius x 1" deep jointer or edging tool. Joints to be clean, cut straight, parallel or square with respect to concrete walk edge. Tool all edges of exposed expansion and contraction joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces.
   1. The expansion joints shall be full depth as shown in the plan details. Failure to do so will result in non-compliance and shall be immediately machine cut by the contractor at his expense.

D. Exposed Concrete Surface Finishing (not including top surface of flatwork): Remove fins and rough spots immediately following removal of forms from concrete which is to be left exposed. Damaged and irregular surfaces and holes left by form clamps and sleeves shall be patched with grout. Tie wires are to be removed to below exposed surface and holes pointed up with neat cement paste similar to procedure noted under "Patching" below. Removal of tie wires shall extend to distance of 2" below established grade lines. Ends of tie wires shall be cut off flush at all other, unexposed locations. Care shall be taken to match adjacent finishes of exposed concrete surface. After patching, all concrete that is to remain exposed, shall be sacked with a grout mixture of 1-part cement, 1 1/2- parts fine sand and sufficient water to produce a consistency of thick paint. After first wetting the concrete surface, apply mixture with a brush and immediately float entire surface vigorously using a wood float. Keep damp during periods of hot weather. When set, excess grout shall be scraped from wall with edge of steel trowel, allowed to set for a time, then wiped or rubbed with dry burlap. Entire finishing operation of any area shall be completed on the same day. This treatment shall be carried to 4" below grade, and all patching and sacking shall be done immediately upon removal of the forms.

E. Stair Treads and Risers: Tool exterior stair tread nosing per ADA requirements and as detailed. Paint or stain tooled area at every stair tread nosing or as detailed. Stair tread nosing shall contain no pockets, voids or spalls. Patching is not allowed. Damaged nosing shall be replaced.

3.10 CURING

A. Flatwork/Variable Height Curbs, Curb and gutter, Valley Gutter: Cure utilizing Curing Compound. If applicable, the Contractor shall verify that the approved Curing Compound is compatible with the approved colorant system. Upon completion of job, wash clean per manufacturer's recommendations.
   1. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the owner.

B. No Curing Compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, run ways, etc.

3.11 DEFECTIVE CONCRETE

A. Determination of defective concrete shall be made by the Architect or Engineer. His opinion shall be final in identifying areas to be replaced, repaired or patched.

B. The Owner reserves the right to survey the flatwork, if it is determined to be outside of the maximum tolerance for flatness. If the flatwork is found to be out of tolerance, then the Contractor will be required to replace concrete. The Contractor will be responsible for

reimbursing the Owner for any surveying costs incurred. Determination of flatwork flatness, surveying and any remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided and the new flatwork or flatwork repairs are properly cured.

C. As directed by Architect or Engineer, cut out and replace defective concrete. All defective concrete shall be removed from the site. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.

D. Permission to patch any area shall not be considered waiver of right, by the Owner, to require removal of defective work, if patching does not, in opinion of Architect or Engineer, satisfactorily restore quality and appearance of surface.

E. Defective concrete is:
1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Excessive Shrinkage, Traverse cracking, Crazing, Curling; or Defective Finish. Remove and replace if repair to an acceptable condition is not feasible.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Expansion joint felt that is not isolating the full depth of the concrete section, and recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.

F. Patching: Install specified Patching Mortar per manufacturer’s recommendations.

3.12 CONCRETE TESTING

A. Comply with CBC Section 1903A, 1905A.1.16, 1910A and 1705A.3 and as specified in B. below. Costs of tests will be borne by the Owner.

B. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.

C. Strength tests will be conducted by the Testing Lab on one cylinder at seven (7) days and two cylinders at twenty-eight (28) days. The fourth remaining cylinder will be available for testing at fifty-six (56) days if the 28-day cylinder test results do not meet the required design strength.

D. On a given project, if the total volume of concrete is such that the frequency of testing required by paragraph B. above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.

E. Cost of retests and coring due to low strength or defective concrete will be paid by Owner and back-charged to the Contractor.

F. Each truck shall be tested for slump before concrete is placed.

3.13 REMOVAL OF FORMS

A. Remove without damage to concrete surfaces.

B. Sequence and timing of form removal shall insure complete safety of concrete structure.

C. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
1. Vertical forms of foundations, walls and all other forms not covered below: 5 days.
2. Slab edge screeds or forms: 7 days.
3. Concrete columns and beam soffits: 28 days.

D. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.

3.14 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

B. Clean excess material from surface of all concrete walks and utility structures.

C. Power wash all concrete surfaces to remove stains, dried mud, tire marks, and rust spots.

END OF SECTION 32 16 00

SECTION 32 17 13 PARKING BUMPERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Precast concrete parking bumpers and anchorage.

B. Reference Standards:
1. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.
2. ASTM C150/C150M - Standard Specification for Portland Cement.
3. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.
4. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete.

1.3 SUBMITTALS

A. See Section 01 33 00: Submittal Procedures.

PART 2 PRODUCTS

2.1 MATERIALS

A. Parking Bumpers - Precast concrete, conforming to the following:
1. Nominal Size: 7 inches high, 12 inches wide, 6 feet long. Manufactured by Granite precast or approved equal.
2. Cement: ASTM C150/C150M, Portland Type I - Normal; white color.
3. Concrete Materials: ASTM C330/C330M aggregate, water, and sand.
4. Reinforcing Steel: ASTM A615/A615M, deformed steel bars; unfinished, strength and size commensurate with precast unit design.
5. Air Entrainment Admixture: ASTM C260/C260M.
6. Concrete Mix: Minimum 4000 psi compressive strength after 28 days, air entrained to 5 to 7 percent.
7. Use rigid molds, constructed to maintain precast units, uniform in shape, size and finish. Maintain consistent quality during manufacture.
8. Embed reinforcing steel, and drill or sleeve for two dowels.
9. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
10. Minor patching in plant is acceptable, providing appearance of units is not impaired.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install units without damage to shape or finish. Replace or repair damaged units.

B. Install units in alignment with adjacent work.

END OF SECTION 32 17 13

SECTION 32 17 23 PAVEMENT MARKINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Parking lot markings, including parking bays, arrows, handicapped symbols, and curb markings.

B. Related Section:
   1. Section 32 12 16: Asphalt Paving.

C. Reference Standards:
   1. CBC Chapter 11B - California Building Code - Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.
   2. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.

1.3 DEFINITIONS

A. Pavement Stripe: Includes traffic control, materials, and all appurtenances not otherwise specified.

B. Pavement Markings: Includes traffic control, setup, materials, and all appurtenances not otherwise specified in the bid schedule.

1.4 SUBMITTALS

A. See Special Provisions for Submittal Requirements.

1.5 QUALITY ASSURANCE

A. Accessible Parking:
   1. Accessible parking spaces serving a particular building or facility shall be located on the shortest accessible route to an entrance complying with CBC Section 11B-208.3.1.
   2. Accessible parking spaces serving more than one accessible entrance shall be dispersed and located on the shortest accessible route to the accessible entrances.
   3. Accessible parking spaces in a parking facility not serving a particular building or facility shall be located on the shortest accessible route to an accessible pedestrian entrance of the parking facility. See CBC Section 11B-208.3.1.
   4. Minimum number of required accessible parking spaces shall be provided in accordance with CBC Table 11B-208.2 for each parking facility provided on a site.
   5. For every six, or fraction of six, accessible parking spaces, at least one shall be an accessible van parking space. See CBC Section 11B-208.2.4.
   6. Accessible parking spaces and access aisles shall comply with CBC Section 11B-502 and shall be dimensioned to the centerline of the marked lines as follows:
      a. Parking spaces and access aisles shall be marked according to CBC Figures 11B-502.2, 11B-502.3, and 11B-502.3.3. Their surfaces shall comply with CBC Section

11B-302 and shall be at the same level with slopes not steeper than 1:48 in any direction. See CBC Section 11B-502.4:

b. Parking spaces shall be 9 feet x 18 feet minimum, and van parking spaces shall be 12 feet by 18 feet minimum with an adjacent access aisle of 5 feet by 19 feet minimum. Access aisles shall be placed on either side of the parking spaces except be located on the passenger side for van parking spaces. Van parking spaces shall be permitted to be 9 feet by 19 feet minimum where the access aisle is 8 feet by 18 feet minimum.
c. Access aisles shall be marked by a blue painted borderline around their perimeters. The area within the blue borderlines shall be marked with hatched lines a maximum of 36 inches on center in a color contrasting with that of the aisle surface, preferably blue or white. Access aisle markings ay extend beyond the minimum required length. See CBC Section 11B-502.3.3.
d. Access aisles (accessible parking spaces as well – similar application) shall not overlap the vehicular way. See CBC Section 11B-502.3.4.
e. A vertical clearance of 8 feet 2 inches minimum shall be provided for accessible parking spaces, access aisles, and vehicular routes serving them. See CBC Section 11B-502.5.

7. At least one passenger loading zone shall be provided in every continuous 100 linear feet of loading zone space, or fraction thereof, complying with CBC Sections 11B-209 and 11B-503 as follows:
   a. Vehicle pull-up spaces shall be 8 feet by 20 feet minimum.
   b. Access aisles shall be 5 feet wide minimum x full length of vehicle pull-up spaces. They shall be at the same level with each other and with slopes not steeper than 1:48 in any direction. Access aisle shall adjoin an accessible route and shall not overlap the vehicular way.
   c. Access aisles for passenger drop-off and loading zone shall be marked with a painted borderline around their perimeters. The area within the borderlines shall be marked with hatched lines a maximum of 36 inches on center in a color contrasting with that of the aisle surface: Blue interior hatch lines are preferred for concrete surfaces and white interior hatch lines are preferred for asphalt surfaces. Where white hatch lines are used, hatch lines shall be interrupted at 12 inches high “No Parking” text so that legibility is maintained.
   d. A vertical clearance of 9 feet 6 inches minimum shall be provide for vehicle pull-up spaces, access aisles, and a vehicular route serving them connecting a vehicular entrance and a vehicular exit. See CBC Section 11B-503.5.
8. Bus loading zones and bus stops shall comply with CBC Sections 11B-209 and 11B-810.2 as follows:
   a. Bus boarding and alighting areas shall be of 8 feet by 5 feet minimum, with 8 feet measured perpendicular to the curb or vehicle roadway edge, and with 5 feet measured parallel to the vehicle roadway. Slopes in 9 feet direction shall be 1:48 maximum. Slopes in 5 feet direction shall be the same as that of the roadway, to the maximum extend practical. See CBC Figure 11B-810.2.2.
   b. Bus shelters shall provide a minimum 30 inches by 48 inches clear floor or ground space (36 inches by 48 inches or 36 inches by 60 inches in an alcove per CBC 11B-305.7), with slopes not steeper than 1:48 in any direction, entirely within the shelter complying with CBC Section 11B-305.
   c. Bus shelters shall be connected by an accessible route complying with CBC Section 11B-402 to a boarding and alighting area complying with CBC Section 11B-810.2 and Figure 11B-810.3.
   d. Newly constructed bus stop boarding and alighting areas shall provide a detectable transition between the boarding/alighting area and the roadway. The detectable transition shall consist of a curb with the face sloped at 35 degrees maximum from vertical or detectable warnings complying with CBC Sections 11B-705.1.1 and 11B-705.1.2.4.
9. Where Electric Vehicle Charging Stations (EVCS) are provided, they shall be provided

in accordance with CBC Section 11B-228.3, Table 11B-228.3.1, and CBC Section 11B-812:

a. Vehicle spaces and access aisles serving them shall comply with CBC Section 11B-302. Access aisles shall be at the same level as the vehicle space they serve. Changes in level, slopes exceeding 1:48, and detectable warnings shall not be permitted in vehicle spaces and access aisles. See CBC Section 11B-812.3.
b. Vehicle spaces, access aisles serving them and vehicular routes serving them shall provide a vertical clearance of 98 inches minimum. See CBC Section 11B-812.4.
c. Accessible routes between EVCS parking, equipment, and the building or facility served shall be provided per CBNC Section 11B-812.5.
d. Vehicle spaces for van accessible, standard accessible, ambulatory and drive-up EVCS shall meet minimum length and width requirements per CBC Section 11B-812.6. All EVCS stalls shall be marked “EV Charging Only” per CBC Section 11B-812.9 and Figure 11B-812.9.
e. Access aisles for van accessible and standard accessible EVCS shall meet minimum length and width requirements and be marked per CBC Section 11B-812.7 the color of the perimeter. Hatch lines and “No Parking” letters shall contrast with the surface color (blue color required for use at non-EVCS accessible parking shall **not** be used).
f. Where four or fewer total EVCS are provided, identification with an International Symbol of Accessibility (ISA) shall not be required. Where five to twenty-five total EVCS are provided, on van-accessible EVCS shall be identified with an ISA complying with CBC Section 11B-703.7.2.1. The required standard accessible EVCS shall not be required to be marked with an ISA. Where twenty-six or more EVCS are provided, all required van-accessible and all required standard accessible AVCS shall be identified with an ISA. The required ISA identification sign shall be reflective with a minimum 70 square inches, shall be visible from the EVCS it serves. The sign shall be permanently posted either immediately adjacent to the vehicle space or within the projected vehicle space at the head end of the vehicle space. Signs identifying van accessible vehicle spaces shall contain the designation “Van Accessible.” Signs shall be minimum 60 inches above the finish surface except that if the sign projects into a pedestrian circulation area, they shall be minimum 80 inches above finish surface. See CBC Section 11B-812.8.
g. Ambulatory EVCS complying with CBC Section 11B-812.6.3 shall be required where 26 or more EVCS are provided. See CBC Table 11B-228.3.2.1.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PART 2 PRODUCTS

2.1 MATERIALS

A. Traffic Paint:
1. Type: Water base, roadway traffic lane marking type; colors as selected.
2. Acceptable Manufacturers:
   a. Dunn-Edwards, Vin-L-Stripe No. W-801, vinyl-epoxy as a standard of quality.
   b. J. E. Bauer latex base Formula No. 1030A9 White, No. 1056A9 Yellow, No. 1865A9 Blue, No. 1118A9 Green, and No. 1854A9 Red.
   c. Sinclair No. 160 Vinyl Traffic Line Paint, water base.

d. Ennis Traffic Safety Solutions, product 6000 white & 6006 blue.

B. Line and Zone Marking Paint - MPI (APL) No. 97 Latex Traffic Marking Paint; white:
1. Roadway Markings: As required by authorities having jurisdiction.
2. Handicapped Symbols: Blue.

C. Striping: Thermoplastic Stripe, In accordance with State of California, Department of Transportation (CALTRANS), Standard Specifications, Section 84.

D. Pavement Markings: Thermoplastic Markings, In accordance with State of California, Department of Transportation (CALTRANS), Standard Specifications, Section 84.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

3.2 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.3 JOB CONDITIONS

A. Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

B. Sequencing, Scheduling: Coordinate with paving work. Verify that paint type is compatible with asphalt paving surfaces seal coats.

C. Protection: Do not apply pavement markings for seven days after application of asphalt surface seal coat. After application, protect from traffic until thoroughly dry.

3.4 PREPARATION

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Clean surfaces thoroughly prior to installation:
1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.

D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.

E. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.

3.5 INSTALLATION

A. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.

B. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.

C. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends:
1. Apply paint in one coat only.
2. Wet Film Thickness: 0.015 inch, minimum.
3. Width Tolerance: Plus or minus 1/8 inch.

D. Parking Lots - Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings:
1. Mark the International Handicapped Symbol at indicated parking spaces.
2. Hand application by pneumatic spray is acceptable.

3.6 DRYING, PROTECTION, AND REPLACEMENT

A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.

B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.

C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.

D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.

E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.

F. Replace removed markings at no additional cost to District.

END OF SECTION 32 17 23

SECTION 32 17 26 TACTILE WARNING SURFACING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Cast-In-Place Pressed Concrete Tiles and Cast-In Place replaceable plastic tactile and detectable warning tiles for pedestrian walking surfaces meeting State of California Building Code 11B requirements.

B. Related Sections:
1. Section 32 13 13: Concrete Paving.
2. Section 32 17 23: Pavement Markings.

C. Reference Standards:
1. 49 CFR 37 - Transportation Services for Individuals with Disabilities (ADA); current edition.
2. AASHTO LRFD - Bridge Design Specifications, Customary U.S. Units (Current Edition).
3. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
4. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
5. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
6. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
7. ASTM C501 - Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.
8. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
9. ASTM D570 - Standard Test Method for Water Absorption of Plastics.
10. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
11. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
12. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
13. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
14. ASTM G155 - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials.
15. ATBCB PROWAG - Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way.
16. FED-STD-595C - Colors Used in Government Procurement (Fan Deck).
17. Accessibility Requirements:
    a. Americans with Disabilities Act of 1990, as amended:
        1) ADA Title II Regulations & the 2010 ADA Standards for Accessible Design.
    b. CBC 2022 California Building Code (CCR Title 24, Part 2, as adopted and amended by DSA):
        2) CBC Chapter 11B, Access to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.

1.3 SUBMITTALS

A. See Section 01 33 00: Submittal Procedures.

B. Product Data: Submit manufacturer's product data, standard details, details specific to this project; written installation and maintenance instructions.

C. Samples: Submit two (2) samples of tactile warning surfacing, 12 x 12 inches minimum, in pattern and color specified.

D. Shop Drawings.

E. Installer Qualifications: Submit evidence that installer meets specified requirements and is certified by manufacturer.

F. Warranty: Submit manufacturer warranty; complete forms in District's name and register with manufacturer.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years documented experience.

B. Accessibility Requirements:
1. Detectable warning surfaces shall comply with CBC Section 11B-705.1.
2. Detectable warning surfaces at transit boarding platform edges, bus stops, hazardous vehicular areas, reflecting pools, and track crossings shall be yellow and approximate 33538 SAE AMS-STD-595A. Detectable warning surfaces at other locations shall contrast with that of adjacent walking surfaces. The material used to provide visual contrast shall be an integral part of the surface. See CBC Section 11B-705.1.1.3.
3. Detectable warning surfaces shall differ from adjoining surfaces in resiliency or sound-on-cane contact. Such constraint shall not be required for detectable warning surfaces at curb ramps, islands, or cut-through medians. See CBC Section 11B-705.1.1.4.

1.5 WARRANTY

A. See Section 01 77 00: Closeout Submittals.

B. Plastic Tiles - Provide manufacturer's standard five (5) year warranty against manufacturing defects, breakage or deformation. Warranty shall also indicate compliance with architectural standards as published in the current edition of the California Building Standards Code, and also include durability criteria which indicate that the shape, color fastness, confirmation, sound-on-cane acoustic quality, resilience, and attachment will not degrade significantly for specified years after initial installation:
1. As used in this bulletin, "not degrade significantly" means that the product maintains at least 90 percent of its approved design characteristics, as determined by the enforcing agency.

C. Installer’s Warranty: 1 year.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Tactile Warning Surfacing shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy plastic wrappings to protect tile from concrete residue during installation and tile type shall be identified by part

number.

B. Tactile Warning Surfacing shall be delivered to location at building site for storage prior to installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Plastic Tactile and Detectable Warning Surface Tiles:
1. **Armorcast Products Company**; armorcastprod.com (Basis of Design).
2. Access Tile, a brand of Access Products, Inc: www.accesstile.com.
3. ADA Solutions, Inc: www.adatile.com/#sle.
4. Armor-Tile, a brand of Engineered Plastics, Inc: www.armortiletransit.com.
5. Or approved equal.
6. Substitutions: See Section 01 25 00: Substitution Procedures and Form.

B. Pressed Concrete Detectable Warning Surface Tiles:
1. **Wausau Tile's** Detectable Warning ADA-2 Pavers. (Basis of Design)

2.2 TACTILE AND DETECTABLE WARNING DEVICES

A. Plastic Tactile and Detectable Warning Tiles - ADA Standards compliant, glass fiber and carbon fiber reinforced, exterior grade, matte finish polyester sheet with truncated dome pattern, solid color throughout, internal reinforcing of sheet and of truncated domes; with factory applied removable protective sheeting:
1. Material Properties:
a. Water Absorption: 0.07 percent, maximum, when tested in accordance with ASTM D570.
b. Slip Resistance: 0.50 minimum dry static coefficient of friction, when tested in accordance with ASTM D2047 or 1.18 dry, 1.05 wet when tested in accordance with ASTM D2047.
c. Compressive Strength: 25,000 pounds per square inch, minimum, when tested in accordance with ASTM D695.
d. Tensile Strength: 10,000 pounds per square inch, minimum, when tested in accordance with ASTM D638.
e. Flexural Strength: 25,000 pounds per square inch minimum, when tested in accordance with ASTM D790.
f. Chemical Stain Resistance: No reaction to 1 percent hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, or antifreeze, when tested in accordance with ASTM D543.
g. Abrasion Resistance: 300, minimum, when tested in accordance with ASTM C501.
h. Flame Spread Index: 25, maximum, when tested in accordance with ASTM E84.
i. Accelerated Weathering: Delta-E of less than 5.0 at 2,000 hours exposure, when tested in accordance with ASTM G155.
j. Loading: No damage when tested according to AASHTO LRFD test method HS20.
k. Salt and Spray Performance: No deterioration or other defect after 200 hours of exposure, when tested in accordance with ASTM B117.
2. Installation Method: Cast in place replaceable.
3. Shape: Rectangular.
4. Color: 33538 SAE AMS-STD-595C, Table IV, Federal Yellow No. 33538, or alternate color meeting CBC 11B-705.1.1.3. and CBC 11B-705.1.1.3.1.
5. Truncated Dome Dimensions:
a. Height: 0.2 inch (5.1mm).
b. Base Diameter: 0.9-inch (22.9mm) minimum to .92-inch (23.4mm) maximum.

c. Top Diameter: 0.45-inch (11.4mm) minimum to .47-inch (11.9mm) maximum.
d. Pattern: Wide Inline (Square) Pattern, 2.35 inches on center each way.

6. Tile Dimensions: As specified on Drawings.
7. Products:
   a. Armorcast; Wet Set / Replaceable Panels; armorcastprod.com.
   b. Access Tile, a brand of Access Products, Inc; Cast in Place Replaceable Tactile Warning Tile: www.accesstile.com.
   c. ADA Solutions, Inc; Cast in Place Replaceable (Wet-Set): www.adatile.com/#sle.

B. Pressed Concrete Detectable Warning Surface Tiles – ADA Standards compliant, Pressed Concrete Truncated Dome Tiles, 2 inch to 2 ¾ inch thickness, 24 inch square and 12 inch square sizes, refer to drawings for details and locations.
1. Materials: Pressed Concrete.
2. Setting Beds: 2 inch sand min. over compacted fill (Depending on location and vehicle impact, refer to manufacturers installation requirements)
3. Truncated Dome Dimensions:
   a. Height: 0.2 inch (5.1mm).
   b. Base Diameter: 0.9-inch (22.9mm) minimum to .92-inch (23.4mm) maximum.
   c. Top Diameter: 0.45-inch (11.4mm) minimum to .47-inch (11.9mm) maximum.
   d. Pattern: Wide Inline (Square) Pattern, 2.35 inches on center each way.
4. Color: Contrasting color to adjacent concrete finish meeting CBC 11B-705.1.1.2 and CBC 11B-705.1.1.3. Color to 33538 SAE AMS-STD-595A.

2.3 ACCESSORIES

A. Fasteners - ASTM A666, Type 304 stainless steel:
1. Type: Countersunk, color matched composite sleeve anchors.
2. Size: 1/4-inch diameter and 1-1/2 inches long.

B. Adhesive: Type recommended and approved by surfacing tile manufacturer.

C. Sealant: Elastomeric sealant of color to match adjacent surfaces; approved by surfacing tile manufacturer.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Maintain minimum temperature of 40 degrees F in spaces to receive Tactile Warning Surfacing for at least 24 hours prior to installation, during installation, and for not less than 24 hours after installation.

3.2 EXAMINATION

A. When installation location is near site boundary or property line, verify required location using property survey.

B. Verify that work area is ready to receive work:

C. If existing conditions are not as required to properly complete the work of this section, notify Architect.

D. Do not proceed with installation until deficiencies in existing conditions have been corrected.

E. Verify that dimensions, tolerances, and attachment methods for work in this section are

properly coordinated with other work on site.

3.3 INSTALLATION, GENERAL

A. Install in accordance with manufacturer's written instructions:
   1. Do not install damaged, warped, bowed, dented, abraded, or otherwise defective units.

B. The physical characteristics of the concrete shall be consistent with the contract specifications while maintaining a slump range of four (4) to seven (7) inches to permit solid placement of the Tactile Warning Surfacing.

C. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. The tile shall be placed true and square to the curb edge in accordance with the drawings. Tiles shall be tamped into fresh concrete to ensure the field level of the tile is flush to adjacent concrete surface.

D. The elevation and slope of the tile shall be set consistent with the contract drawings to permit water drainage and eliminate ponding.

E. Field Adjustment:
   1. Locate relative to curb line in compliance with CBC Chapter 11B, Section 705.
   2. Orient so dome pattern is aligned with the direction of ramp.
   3. Align truncated dome pattern between adjacent units.

F. Install units fully seated to substrate, square to straight edges and flat to required slope.

3.4 INSTALLATION, CAST IN PLACE PLASTIC TILES

A. When installing multiple adjacent units, leave a 3/16-inch gap between units to allow for expansion.

B. Tamp and vibrate units as recommended by manufacturer.

C. Place and position weights on units while concrete cures as recommended by manufacturer. Ensure no voids or air pockets exist between top surface of concrete and underside of units.

3.5 CLEANING PLASTIC UNITS

A. Remove protective plastic sheeting within 24 hours of installation.

B. Remove excess sealant or adhesive from joints and edges.

C. Clean four days prior to date of scheduled inspection.

3.6 PROTECTION

A. Protect installed units from traffic, subsequent construction operations or other imposed loads until concrete is fully cured.

B. Touch-up, repair or replace damaged products prior to Date of Substantial Completion.

END OF SECTION 32 17 26

SECTION 32 31 13 CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. All Chain link fences, new or modernized shall comply with all local codes and zoning, where located on property and in route of travel all hardware to meet specified requirements listed here-in. Refer to Drawings and Details.

B. Related Section:
   1. Section 03 30 00: Cast-In-Place Concrete.

C. Reference Standards:
   1. ASTM International (ASTM):
      a. A392, Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
      b. F567, Standard Practice for Installation of Chain Link Fence.
      c. F626, Standard Specification for Fence Fittings.
      d. F900, Standard Specification for Industrial and Commercial Swing Gates.
      e. F1083, Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded for Fence Structures.
      f. F2611, Standard Guide for Design and Construction of Chain Link Security Fencing.

D. Accessibility Requirements - Comply with applicable requirements:
   1. Americans with Disability Act of 1990, as amended.
   2. 2022 California Building Code (CBC):
      a. CBC Chapter 11B - California Building Code - Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing; 2022.
      b. Door and Gate closures shall comply with 11B-404.2.8.1.
      c. Door and Gate opening force shall comply with 11B-404.2.9.
      d. Door and Gate operation shall comply with 11B-309.4.
   3. California Referenced Standards Code:
      a. CCR Title 24, Part 2, as adopted and amended by DSA.
      b. Title 24, Part 12, Section 12-10-202, Item (F).

1.4 SUBMITTALS

A. Product Data:
   1. Manufacturer’s schedules, charts, literature, and illustrations indicating the performance, fabrication procedures, product variations and accessories indicating material compliance and specified options.
   2. Manufacturer’s installation instructions.

B. Shop Drawings: Indicate materials, dimensions, details, and finish, show locations and installation procedures. Include details of fence and gate joints, attachments, accessories, footings, and clearances.

1.3 QUALITY ASSURANCE

A. Accessibility Requirements for Fences, Gates, and Hardware:
   1. Gates that are part of the accessible route shall meet all the requirements of an accessible door in compliance with CNC Section 11B-404.
   2. The levers of lever actuated latches or locks for accessible gates shall be curved with a return to within ½ inch of the gate surfaces to prevent catching on the clothing or persons. See California Referenced Standards Code T-24, Part 12, Section 12-10-202, Item (F).
   3. Swing doors and gate surfaces within 10 inches of the finish floor or ground shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints in these surfaces shall be within 1/16 inch of the same plane as the other and be free of sharp or abrasive edges. Cavities created by added kick plates shall be capped. See CBC Section 11B-404.2.10.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Specifications are based on products of Anchor Fence by Master Halco Inc., Baltimore, MD, Phone (800) 229-5615.

B. Other manufacturers must have a minimum of five (5) years' experience manufacturing chain link fencing and gates meeting or exceeding the following specifications for design, size, gauge, finish of metal parts and fabrication and comply with Division 01 requirements for substitutions in order to be considered:
   1. Golden State Fence, Co Inc, Rancho Cordova, CA (916) 468-0975
   2. S & S Fence Co, Sacramento, CA (916) 682-1100

2.2 CHAIN LINK FENCE MATERIALS

A. General:
   1. Selvage: Knuckled finish top and bottom.
   2. Steel Fabric: Comply with Chain Link Fence Manufacturers Institute (CLFMI) Product Manual. Furnish one-piece fabric widths for fencing up to 16 feet high. Wire sizes includes zinc coating.
   3. Galvanized Wire: Zinc coated wire-ASTM A392, Class 1, with not less than 1.2 oz. zinc. per sq. ft.

B. Fence Fabrics:
   1. Type B - Non-Slatted Fabric: Standard Industrial grade, 2" mesh, 9 gauge zinc coated steel wire, top selvage twisted tight, bottom selvage knuckled end closed.

C. Fence Framing:
   1. Strength requirements for posts and rails shall conform to ASTM F1043.
   2. Pipe shall be straight, true to section, material, and sizes specified, and shall conform to the following weights per foot:

NPS in inches	Outside Diameter (OD) in inches	Type 1 Steel	Type II Steel
1	1.315	1.68	1.35
1.25	1.660 (1-5/8")	2.27	1.84
1.5	1.900 (2")	2.72	2.28
2	2.375 (2-1/2")	3.65	3.12
2.5	2.875 (3")	5.79	4.64
3	3.500	7.58	5.71
3.5	4.000	9.11	6.56

4	4.500	10.79	---
6	6.625	18.97	---

3. Posts, Rails, Braces, and Gate Frames - Steel pipe - Type I - ASTM F1083, standard weight Schedule 40; minimum yield strength of 25,000 psi; sizes as indicated below. Hot-dipped galvanized with minimum average 1.8 oz/ft² of coated surface area:
   a. Line posts: 2 inch o.d, weighing 2.72 lb/ft.
   b. Terminal, End, Corner, and Pull Posts: 2-1/2 inch o.d., weighing 3.65 lb/ft.
   c. Rails and Braces: 1-5/8 inch o.d., weighing 2.27 lb/ft.
4. End, corner, and pull posts for following fabric heights:
   a. Under 6 feet: 2.375" OD (2-1/2" OD)
   b. 6 feet to 10 feet: 2.875" OD (3" OD) (with privacy slats provide 3.5" OD)

5. Line or intermediate posts for following fabric heights:
   a. Under 6 feet: 1.90" OD (2" OD)
   b. 6 feet to 8 feet: 2.375" OD (2-1/2" OD) (with privacy slats provide 3" OD)
6. Top, Bottom and Horizontal Intermediate Rails:
   a. Top, bottom and horizontal intermediate rails (as applicable) shall be 1.66" OD (1-5/8"OD)
7. Gate Posts: Furnish posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:
   a. 6 feet to 10 feet: 3.5" OD
   b. Under 6 feet: 2-7/8" OD
8. Gate Frames: Furnish frames (single or double gate), for nominal gate widths as follows:
   a. 6 feet to 10 feet: 1.90" OD (2" OD)
   b. Under 6 feet:1.66" OD (1-5/8"OD)
9. All gates with panic hardware, the frame and adjacent posts are to be fabricated with steel tubing. Refer to Section 32 31 19: Decorative Metal Fences and Gates.

D. Concrete: ASTM C94/C94M-19a; Portland Cement, 3,00 p.s.i. strength at 28 days, 3 inch slump; one inch maximum sized coarse aggregate.

E. Fence Accessories:
1. Chain Link Fence Accessories: Provide items required to complete fence system. Galvanize each ferrous metal item and finish to match framing.
2. Post Caps: Formed steel, cast malleable iron, or aluminum alloy weathertight closure cap for tubular posts. Provide one (1) cap for each post (where top rail is used, provide tops to permit passage of top rail).
3. Top Rail and Brace Rail Ends: Formed steel, malleable or cast iron, for connection of rail and brace to terminal posts.
4. Top Rail Sleeves: 6 inch sleeve allowing for expansion and contraction of top rail.
5. Wire Ties: 9 gauge galvanized steel wire for attachment of fabric to line posts. Double wrap 13 gauge for rails and braces. Hog ring ties of 12-1/2 gauge for attachment of fabric to tension wire.
6. Brace and Tension (Stretcher Bar) Bands: Pressed steel.
7. Tension (Stretcher) Bars: One piece lengths equal to 2 inches less than full height of fabric with a minimum cross-section of 3/16 inch x 3/4 inch or equivalent fiber glass rod. Provide tension (stretcher) bars where chain link fabric meets terminal posts.
8. Tension Wire: 7 gauge, diameter core wire with tensile strength of 75,000 psi.
9. Truss Rods: Steel rods with minimum diameter of 5/16 inch.
10. Fasteners: Galvanized nuts and bolts.

2.3 CHAIN LINK SWING GATES

A. Gate Frames: Fabricate chain link swing gates in accordance with ASTM F900 using

galvanized steel tubular members, 2 inches square, weighing 2.60 lb/ft. Fusion or stainless steel welded connections forming rigid one-piece unit.

B. Chain Link Fence Fabric: Same as specified above for fence. Install fabric with hook bolts and tension bars at all four (4) sides. Attach to gate frame at not more than 15 inches on center.

C. Hardware Materials - Hot dipped galvanized steel or malleable iron shapes to suit gate size.
1. Hinges: Structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing 180 degrees inward.
2. Latch: Non-accessible; Forked type capable of retaining gate in closed position and have provision for padlock. Latch shall permit operation from either side of gate.
3. Gate Hardware: Shall conform to 1.2.D this section and as listed in part 4 below.
4. Keeper: Provide keeper for each gate leaf over five (5) feet wide. Gate keeper shall consist of mechanical device for securing free end of gate when in full open position.
5. Drop Rod: Provide at double gates to hold inactive leaf. Provide gate stop pipe to engage center drop rod. Provide locking device and padlock eyes as an integral part of latch, requiring one (1) padlock for locking both gate leaves.

D. Gate Posts - Steel pipe, ASTM F1083, standard weight Schedule 40; minimum yield strength of 25,000 psi. Hot-dipped galvanized with minimum 1.8 oz/ft² of zinc. Sizes as follows:
1. Width for single gate or one gate leaf of double gates:
   a. 6 feet or less: 2.875 inches in diameter, weighing 5.79 lb/ft.
   b. Over 6 feet to 12 feet: 4.00 inches in diameter, weighing 9.11 lb/ft.
   c. Over 12 feet to 19 feet: 6.625 inches in diameter, weighing 18.97 lb/ft.

2.4 SETTING MATERIALS

A. Concrete: Minimum 28 day compressive strength of 3,000 psi.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify areas to receive fencing are completed to final grades and elevations.

B. Ensure property lines and legal boundaries of work are clearly established.

3.2 CHAIN LINK FENCE FRAMING INSTALLATION

A. Install chain link fence in accordance with ASTM F567 and manufacturer’s instructions.

B. Locate terminal post at each fence termination and change in horizontal or vertical direction of 30 degrees or more.

C. Space line posts uniformly at 10 feet on center.

D. Concrete fence post footings:
1. Drill holes in firm, undisturbed or compacted soil. Excavate deeper than specified below as required for adequate support in soft and loose soils, and for posts with heavy lateral loads.
2. Line posts shall be set in 9 inch minimum diameter concrete piers, with a minimum of 36 inches of post embedment in concrete with an additional 3 inch concrete cover at bottom.

3. All end, corner, and pull posts shall be set in minimum 12 inch minimum diameter concrete piers, with a minimum of 36 inches of post embedment in concrete with an additional 3 inch concrete cover at bottom.
4. Place concrete around posts in a continuous pour.
5. Trowel finish around post. Slope to direct water away from posts.

E. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

F. Bracing: Install horizontal pipe brace at mid-height for fences six (6) and over, on each side of terminal posts. Firmly attach with fittings. Install diagonal truss rods at these points. Adjust truss rod, ensuring posts remain plumb.

G. Tension Wire: Provide tension wire at bottom of fabric. Install tension wire before stretching fabric and attach to each post with ties. Secure tension wire to fabric with 12-1/2 gauge hog rings 24 inches on center.

H. Top Rail: Install lengths, 21 feet. Connect joints with sleeves for rigid connections for expansion/contraction.

I. Bottom Rails: Install bottom rails between posts with fittings and accessories.

3.3 CHAIN LINK FABRIC INSTALLATION

A. Fabric: Install fabric on security side and attach so that fabric remains in tension after pulling force is released. Leave approximately 2 inches between finish grade and bottom selvage. Attach fabric with wire ties to line posts at 15 inches on center and to rails, braces, and tension wire at 24 inches on center.

B. Tension (stretcher) bars: Pull fabric taut; thread tension bar through fabric and attach to terminal posts with bands or clips spaced maximum of 15 inches on center.
1. Install to the guideline of ASTM F2611.

3.4 ACCESSORIES

A. Tie Wires: Bend ends of wire to minimize hazard to persons and clothing.

B. Fasteners: Install nuts on side of fence opposite fabric side for added security.

3.5 CHAIN LINK SWING GATE POST INSTALLATION

A. Install gate posts in accordance with manufacturer’s instructions.

B. Concrete gate post footings:
1. Drill holes in firm, undisturbed or compacted soil. Excavate deeper than specified below as required for adequate support in soft and loose soils, and for posts with heavy lateral loads.
2. All gate posts shall be set in minimum 12 inch diameter concrete piers, with a minimum of 36 inches of post embedment in concrete with an additional 3 inch concrete cover at bottom.
3. Place concrete around posts in a continuous pour.
4. Trowel finish around post. Slope to direct water away from posts.

C. Gate posts and hardware: Set keeper, stops, sleeves into concrete. Check each post for vertical and top alignment, and maintain in position during placement and finishing

operations.

3.6 GATE INSTALLATION

A. Install gates plumb, level, and secure for full opening without interference.

B. Attach hardware by means which will prevent unauthorized removal.

C. Adjust hardware for smooth operation.

3.7 CLEANING

A. Clean up debris and unused material, and remove from the site.

PART 4 HARDWARE

4.1 HARDWARE LISTING

A. Group 1 - Man Gate Hardware:
   1. Exit Hardware: Von Duprin 98/99 Series Rim Device.
   2. 996L Breakaway Lever w/IC Large Format Core.
   3. Format IC Core (Keyed per District Requirement).
   4. Closure: LCN 4040xl Series Closer.
      a. Alt.: Locinox Inc. Gate closure hinge, Tiger.
      b. Alt.: Locinox Inc. Gate closure, Verticlose.
   5. Kick Plate: 10 GA. Galv.
   6. Hardware Backing-Plate: 24” tall X width of gate 16 GA Galv.
   7. Closure Backing Plate: Sized fit item c. Closure.
   8. Flat mounted Gorilla weld on hinges. (See 4.a. Tiger hinge)

B. Knox Boxes:
   1. Knox Rapid Entry System, 3200 Series, Knox Company, 1601 W. Deer Valley Road, Phoenix, AZ 85027 800-552-5669.
      a. Location as noted on Drawings.
      b. Local Fire Dept. Approval may be required.

END OF SECTION 32 31 13

SECTION 32 84 00 LANDSCAPE IRRIGATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. System design, trenching, laying of pipes and control wires, installation of valves, sprinkler heads, backfill, testing, adjustment and be complete, ready for operation.

1.2 RELATED SECTIONS

A. Section 32 90 00 – Landscape Planting

1.3 REFERENCES

A. The publications listed below form a part of this Section to the extent referenced. The publications are referred to in the text by the basic designation only. Refer to Section 01 42 00 for definitions, acronyms, and abbreviations.

B. Referenced Standards, Manuals and Codes:

1. ASTM D1785 – Standard Specification for Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120.
2. ASTM D2241 – Standard Specification for Poly Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series).
3. ASTM D2466 – Standard Specification for Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40.

1.4 INTENT OF SPECIFICATIONS

A. It is the intention of these specifications to design and install a sprinkler system free from defects in materials and workmanship.

1.5 ORDINANCES AND REGULATIONS

A. All local, municipal, and state laws, rule and regulations governing any portion of this work shall be made a part of these specifications and their provisions carried out.

1.6 EXAMINATION OF DRAWINGS AND SITE

A. Before submitting a bid, each bidder shall carefully examine the site and note all existing conditions and limitations applying to the work including “patch and repair” considerations to the existing irrigation system and the surrounding landscape and include in his bid a sum sufficient to cover the cost of all items.

1.7 PROTECTION

A. The Contractor shall be responsible for covering all pipe openings, valves, etc., before and after being set in place to prevent obstructions in the pipe and valves.

1.8 DAMAGE TO PROPERTY

A. The Contractor shall restore it to its original condition, without change, any damage due to the negligence of any of the Contractor's employees, agents or subcontractors.

B. Any existing buildings, equipment, piping, pipe coverings, sewers, sidewalks, landscaping, etc., damaged during his work shall be replaced or repaired in a manner satisfactory to the Architect and at the Contractor's own expense and before final payment will be made.

1.9 DAMAGE BY LEAKS

A. The Contractor shall be responsible for damage to the grounds, walks, roads, building, piping systems, electrical systems and their equipment and contents caused by leaks being installed or having been installed. He shall repair at his expense all damage so caused. All repair work shall be done in a manner satisfactory to the Architect.

PART 2 PRODUCTS

2.1 LIST OF MATERIALS FOR APPROVAL

A. Within 20 days after the Award of Contract, the Contractor shall submit to the Architect for review five copies of a complete materials list, together with manufacturer's name numbers covering all material to be furnished under this contract. The contract shall also furnish five copies of descriptive literature on all items listed on the material list. No work shall be commenced before receipt of approved material list and descriptive material. List shall cover items listed below if specified or indicated on drawings:

Shut-off valves

Valve boxes

Backflow prevention device

Master valve

Flow sensor

Copper pipe and fittings

Remote control valves

Remote control valve ID tags

Automatic controller

Control wire and connectors

Check valves

Sprinkler heads

Drip irrigation equipment

2.2 SHUT-OFF VALVES

A. (Except when a part of the backflow prevention device), 1/2" through 2" shall be 150 lbs. WOG bronze gate valves non-rising stem and wheel. Gate valves shall be Nibco T-29 or Hammond #4687. 3” and larger shall be AWWA resilient wedge gate valve. The body shall be epoxy coated inside and out, with "0" push-on ends for PVC via rubber rings. Gate valves shall be Stockham, Mueller, Kennedy or approved equal. All gate valves shall be domestically manufactured.

2.3 VALVE BOXES FOR SHUT-OFF VALVES

A. 10" round plastic valve box with bolt down cover, extensions as required. Carson #910-12B or approved equal.

2.4 COPPER WATER TUBING

A. Hard drawn government type "K" water tube. Use type where indicated on drawings.

2.5 FITTINGS – NON-FERROUS METAL (for copper water tubing)

A. Wrought copper and/or cast red brass for solder and/or screw connections with name and manufacturer thereon.

2.6 SOLDER

A. Solder for copper water tube shall be 95-5, tin-antimony.

2.7 RED BRASS PIPE

A. Federal specification No. WW=P-351 medium weight, IPS, with threads to conform to ASA Specifications B2.

2.8 DI-ELECTRIC ISOLATION

A. Provide between all connections joining ferrous and non-ferrous metals or old (existing) ferrous and new ferrous metals. Submit for approval, type "intended for use”.

2.9 PVC PIPE

A. All PVC pipes shall be permanently and continuously marked with manufacturer's name, pipe size (IPS), class or schedule SDR number (class pipe only), ASTM (D-2241 for class pipe and D-1785 for schedule pipe), manufacturer's lot number and NSF approval. Pipe with dents, wrinkles, die, or heat marks is not acceptable. Pipe shall be delivered to the site in 20’ lengths.

2.10 THREADED PVC NIPPLE

A. SCH 80, type 1, 4” minimum length, except where detailed otherwise in drawings.

2.11 PVC MAINLINE

A. 1120/1220 normal impact, SCH 40 and Class 315, solvent weld; size as noted in drawing.

2.12 PVC LATERALS (NON-PRESSURE PIPING)

A. 1120/1220 normal impact, SCH 40, solvent weld type PVC; size as noted in drawing.

B. As indicated in the drawings.

2.13 FITTINGS – PVC

A. PVC fittings for make-up shall be of the same chemical compound as the pipe on which it is installed. Use ASTM D2466 Type 1 or I/II SCH 40 Polyvinyl Chloride fittings.

2.14 PIPE COMPOUND FOR PVC

A. Best grade Teflon tape on all threaded connections.

2.15 PRIMER AND SOLVENT

A. As recommended by the manufacturer of the PVC pipe, chemically compatible with the pipe, fittings and solvent.

2.16 REMOTE CONTROL VALVES

A. Refer to drawings.

2.17 WIRING TO REMOTE CONTROL VALVES (24 VOLT), MASTER VALVE AND FLOW SENSOR

A. Electrical requirements from controller to remote control valves shall be U.F. type, UL approved, AWG #14 solid strand copper wire with minimum 4/64" PVC coating, 600-volt, 75°C. All control wires from the valve to the controller shall be of one color. Common wire shall be white. Master valve and flow sensor color must be different than control valve color.

2.18 WIRE CONNECTIONS FOR DIRECT BURIAL WIRE

A. Connector shall be 600-volt, 60°C, AWG-UF type, waterproof, epoxy or PVC compound filled containers, 3M seal packs or approved equal.

2.19 SPRINKLERS HEADS

A. Refer to drawings.

PART 3 EXECUTION

3.1 GENERAL

A. Comply with all governing construction for all work under this section.

B. All work shall be assembled to conform to notes on the drawings, whether mentioned in this section of the specifications.

C. Observe installed work of other trades and verify that it is complete to the point where irrigation work may properly commence.

D. Provide at least one qualified person who shall be present always during execution of the work. This person shall be familiar with the type of materials being installed and the material manufacturer's recommended methods of installation and direct all work performed under this Section.

3.2 VERIFICATION OF DIMENSIONS

A. Verify all horizontal and vertical site dimensions prior to staking of heads.

3.3 LAYOUT OF HEADS AND STAKING

A. Sprinkler heads shall be staked and installed in the locations shown on the shop drawings. Discrepancies between drawings and site shall be brought to the attention of the Architect prior to trenching. Do not exceed maximum spacings shown on drawings or exceed the GPM of the pipe sizes shown. If spacing demands additional or less materials, notify Architect before commencing work.

3.4 TRENCHING

A. Check all grades so that work may proceed, keeping materials at specified depth.

B. Do all excavation for installation of work included in contract. Mechanical trenching machines shall be of approved type to cut trenches with straight sides. Trenches shall be only wide enough to lay the pipe and control wires. Perform minor adjustments to avoid existing utilities as directed without additional cost. "Pulling" of piping and/or control wires will not be permitted.

C. Trenches shall be deep enough to provide minimum cover from finish grade as follows:

1. 18” minimum cover over supply lines to remote control valves which go under concrete or porous pavement system.
2. 18” minimum cover over control wires from controller to valves.
3. 12” minimum cover over lateral lines to sprinkler heads.

D. Hand trench within the drip line of all trees with a caliper greater than 8”.

E. Use all possible care to protect existing trees and plants, during trenching. Roots 2" or larger in diameter shall be tunneled under and wrapped with wet burlap to prevent scarring or drying. When roots 1” and larger are cut, they shall be painted with two coats of approved sealer manufactured for this purpose. Cover all trenches in root areas (only while open) with wet burlap and backfill within 24 hours after opening the trench.

F. If the pipe must be laid after paving is in place, it shall be done by jacking, boring or hydraulic driving. Boring is unacceptable under AC pavement. If cutting or breaking any paving is necessary, it shall be done and replaced with like material at the expense of the Contractor after obtaining approval of the Architect.

G. All pipes under concrete shall be sleeved inside of larger pipe and have 1/2" clearance.

3.5 BACKFILLING

A. The trenches shall not be backfilled until all required tasks and testing are performed and reviewed by the Architect. Trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, or other approved materials, free from large clods of earth or sharp stones.

B. Backfilling for pressure piping shall be compacted and tamped as follows:
   1. Install backfill material and cover over piping. Add 6” lifts of backfill soil and mechanically tamp.

C. After the system is working, run sprinklers for a minimum of one hour and retamp as needed. NO WHEEL ROLLING WILL BE ALLOWED.

D. Backfill for any trench shall be compacted to dry density equal to 90% and conform to the adjacent grades without dips, sunken areas, humps, or other irregularities.

E. All rocks uncovered and debris must be disposed of by Irrigation Contractor off-site at his cost.

3.6 ASSEMBLY

A. Copper pipe
   1. Cut ends square; remove all burrs inside and out.
   2. Clean tube and pocket or fittings to bright finish using #00 steel wood or sand cloth.
   3. Coat tubing and inside of fitting with a paste-type non-corrosive solder flux and assemble.
   4. Apply heat and solder. Do not use oxygen gas.
   5. Remove residual solder and flux with rag or brush and allow joint to cool.
   6. Fill pipe with water and pressure test.

B. PVC Plastic Pipe
   1. Handle with care when loading, unloading, transporting, and storing material to avoid damage. Store pipe and fittings under cover before using. Transport in vehicle with bed or sufficient length to carry pipe flat and fully supported. Store pipe in same manner.

2. Solvent welding: Use non-synthetic brush to spread primer and solvent using no larger than pint-sized cans. Clean and refill cans each day. Cut pipe square, ream, chamfer outside end. Clean and dry pipe end with prime, prime inside socket again. Immediately apply solvent to pipe end and to socket, then again to pipe end. Bottom the pipe in socket and turn 90°. Hold joint together 30 seconds. Wipe off excess solvent. To set 30 minutes before moving. Centerload pipe with small amount of backfill to prevent arching and whipping under pressure, leave joints exposed.
3. Threaded connections: Use Teflon tape on plastic threaded joints. Screw hand tight and another half turn by wrench. On PVC to metal pipe, work the metal connection first.

3.7 LAYING OF LINES

A. All lines set in place under paving shall extend 12" minimum beyond such paving edges and be capped hand tight. No fittings, including couplings, will be permitted under surfaces to be paved except where the length of the line under the paving exceeds 20’ or where shown in drawings, i.e., parking lots, etc.

B. All piping shall be installed by conventional trenching. The width of the trenches for the irrigation system shall not be greater than necessary to permit satisfactory jointing and other installation procedures, such as tamping of bedding material under and around the pipe. The bedding surface shall provide a firm foundation of uniform density through the entire length of the pipe. Snake PVC plastic pipe side to side in trench bottom keeping 4" horizontal clearance between two pipes in same trench. Do not lay pipe in trench containing water or at less than 32°F. Center load immediately, leaving joints exposed.

C. Make trenches wide enough to allow minimum of six inches (6”) between parallel pipe lines and three inches (3”0 between side of pipe and side of trench. Do not allow stacking of pipe within trench.

D. Allow a minimum clearance of twelve inches (12”) in any direction from parallel pipes of other trades.

3.8 LAYING OF CONTROL WIRES (24 VOLTS)

A. Lay wires in common trench with mainline wherever possible. Splicing as allowed with 24” expansion loop only in concrete electrical junction box with bolt down lid. Common wire and control wires are to be tagged with 1/4" wide embossed plastic labeling tape, showing controller and station number designation. Use plastic electrical tape and bind all control wires in bundles at 10’ intervals. All splices shall be waterproof.

3.9 FLUSHING OF LINES

A. Mainlines shall be flushed before attaching remote control valves with pipe centerloaded. All water being discharged shall be temporarily piped up and out of the trenches. Trenches are to be kept dry for pressure tests to follow. Install all valves after flushing procedures.

B. Laterals shall be flushed before sprinkler heads are installed. Cap all risers, apply pressure, remove caps in sequence starting at the nearest control valve. Replace caps before removing caps to follow. Continue to end each lateral. Flush until all foreign matter and mud is cleared out of the system. Contractor to provide all materials needed for flushing operations.

3.10 PRESSURE TESTS

A. Prior to Backfilling, perform all hydrostatic tests in presence of the IOR after flushing lines. Maintain maximum pressure on main lines and lateral lines, after welded plastic joints have cured at least twenty-four hours and with the risers capped, without any pressure drop with all air expelled at 125 PSI on mainline for four hours and 100 PSI on lateral lines for one hour. All leaks shall be corrected in a mechanical manner without use of epoxy filler compounds.

3.11 DRAWINGS OF RECORD

A. Maintain a complete and accurate set of project record drawings. These drawings shall be kept up to date with the progress of the work.

B. The contractor shall provide adequate measurements and field notes as directed by the City Inspector and/or Architect for preparation of accurate “Project Record” drawings. Show either actual locations or dimensions form two permanent points of reference such as building corners, curbs, sidewalk, intersections, etc. (but not from irrigation equipment) locations of the following.
   1. Connections to existing water sources.
   2. Water meters.
   3. Routing of main lines.
   4. Control valves.
   5. Quick couplers.
   6. Backflow prevention devices.
   7. Gate valves.
   8. Routing of control wiring.
   9. Controllers.

3.12 LOWERING HEADS, VALVE BOXES, QUICK COUPLER VALVES, ETC.

A. All the above and any other equipment that may be damaged by mowing shall be set flush to finished grade or as called out on the drawings, prior to final acceptance. Replace any equipment damaged by mowing during the Owner's first 60 days of maintenance after the conclusion of the Contractor's maintenance period at no cost.

3.13 ADJUSTING SYSTEM

A. Adjust entire system prior to coverage test and again at conclusion of maintenance period.
   1. Set all shut-off valves in the system to fully open positions.
   2. Adjust all stationary heads to uniform coverage on each system using adjusting screws in each sprinkler head and by control of the throttle device on each remote-control valve.
   3. Adjust all rotary head systems using pitot tube with pressure gauge attached by regulating the remote-control valve. Adjust all radii to fit requirements on drawings if heads are equipped with such a device. Follow the same procedures for impact heads.
   4. Adjust arcs of all heads to prevent overspray on areas to be kept dry. These changes or adjustments shall be made without additional cost.

3.14 COVERAGE TEST

A. When installation of the sprinkler system is completed, perform a coverage test in the presence of the Architect to determine that coverage for planting and turf areas is complete and adequate. This test shall be accomplished before any turf is planted. Where inadequate coverage occurs, the Contractor shall provide necessary material and perform work to correct all inadequacies.

3.15 CONTROLLER CHARTS

A. Project record drawings shall be prepared by the Contractor before the charts are prepared.

B. Provide one controller chart for each controller supplied.

C. The chart shall show the area controlled by an automatic controller and shall be the maximum size controller door will allow.

D. The chart is to be reduced drawing of the installed system. However, in the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a size that will be readable when reduced.

E. Chart shall be black line print and a different color shall be used to show area of coverage for each station. Provide one digital copy of the colored chart to the Owner along with the record drawings.

F. The chart shall be mounted using Velcro, or an approved equal type of comparable quality.

G. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum 20 mil. thick.

H. These charts shall be completed and approved prior to final inspection of the irrigation system.

3.16 ITEMS FURNISHED

A. At time of final acceptance, Contractor shall deliver to the Owner:

1. Two tools for disassembly and assembly or adjustment, for each type of sprinkler equipment used in this installation requiring such special tools.
2. Two sets of operation instructions and parts lists, as printed by each manufacturer of each type of equipment installed, in three-ring binder. Refer to "Materials" section of the specifications and legend on drawings.
3. Two sets of a list of equipment with names and addresses of manufacturers' representatives, in three-ring binder.

3.17 FINAL ACCEPTANCE

A. All equipment shall be checked and adjusted in height locations, performance and appearance at the time of final acceptance.

B. All damaged portions shall be replaced with new materials of like-kind.

END OF SECTION 32 84 00

SECTION 32 90 00 LANDSCAPE PLANTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Landscape finish grading

B. Soil preparation

C. Concrete Headers

D. Tree supports

E. Planting, including lawn

F. Watering

G. Observation schedule

H. Clean-up

1.2 RELATED SECTIONS

A. Section 32 84 00 – Landscape Irrigation

1.3 QUALITY ASSURANCE

A. Qualifications of Installers: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Approvals: Sprinkler work shall be inspected, tested, and approved before the start of any work of this Section. Before covering and backfilling subsurface drains and any surface drain lines, inspect and be responsible for performance thereof.

C. Legal Requirements: Give adequate and required legal notices to Owner, utility organization and governing authorities prior to commencing.

D. Source Quality Control

1. Plants shall be subject to inspection and approval at place of growth or upon delivery for conformity to specifications. Such approval shall not impair the right inspection and rejection during progress of the work.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery

1. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trademark, and conformance to State Law.
2. Deliver plants with legible identification labels.
   a. Label trees, evergreens, bundles of containers of like shrubs or groundcover plants.
   b. State correct plant name and size indicated on plant list.

c. Use durable waterproof labels with water-resistant ink which will remain legible for at least 60 days.

3. Protect plant material during delivery to prevent damage to root balls or desiccation of leaves.

4. The Contractor shall notify the Architect 48 hours in advance of delivery of all plant materials and shall submit an itemized list of the plants in each delivery.

B. Storage:

1. Store plant material away from construction activity areas.

2. Maintain and protect plant material.

C. Handling:

1. Do not drop plant materials.

2. Do not pick up container plant material by stems or trunks.

1.5 CERTIFICATION

A. Prior to start of work, submit written certification (purchase order receipts), to Owner and Architect for following items:

1. Quantity of commercial fertilizer and organic fertilizer.

2. Quantity of all specified soil amendments and bark mulch.

3. Quantity of seed (or sod).

4. Quantity of all rooted cuttings, liners, or pots of groundcover plants.

1.6 JOB AND ENVIRONMENTAL CONDITIONS

A. Verification of Existing Conditions: Examine site and determine and verify existing conditions including subsurface conditions. Written dimensions take precedence over scaled dimensions; verify and be responsible for dimensions and conditions. Notify Architect in writing of any variations from dimensions and conditions shown; submit to Architect for signed approval before proceeding with landscaping.

B. Planting: Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.

C. Scheduling: Install trees, shrubs and liner stock plant material before lawn areas are installed.

1.7 COORDINATION

A. Coordinate operation with other trades, utility firms, street tree department and other affected public departments to assure continuity of access and service in conformance with applicable requirements specified.

1.8 PLANT MATERIAL

A. Locate and secure plant material within 15 days of Award of Contract to avoid last minute plant substitutions.

B. Landscape Architect reserves the right to deny substitutions if evidence of this effort has not been made prior.

1.9 SAMPLES AND TESTS

A. Architects reserve the right to take and analyze samples of materials for conformity to specifications at any time. Contractor shall furnish samples upon request by Architect. Rejected materials shall be immediately removed from the site at Contractor's expense. The cost of testing of materials not meeting specifications shall be paid by Contractor.

B. Following completion of rough grading and topsoiling, a soil test shall be performed by the landscape contractor to determine agricultural suitability of the existing soils.

1. Take one (1) sample for every 5,000 s.f. of landscape area up to a maximum of six (6) samples.

a. Provide analysis of soil samples for PH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

b. Instruct the lab to include a minimum recommendation of two (2) cubic yards per 1,000 square feet of landscape area.

1.10 GUARANTEE AND REPLACEMENTS

A. Guarantee: All plant material installed under the Contract shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship for a period of 90 days. Guarantee period to start at the end of the contract maintenance period and acceptance of work. Any plant found to be dead or in poor condition due to faulty materials or workmanship, as determined by the Architect, shall be replaced by the Contractor at his expense.

B. Replacements: Any materials found to be dead, missing or in poor condition during the contract maintenance period shall be replaced immediately. The Architect shall be the sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within 15 days of written notification by the Owner.

C. Contractor will not be held responsible under the above guarantee for damage arising from acts of God, vandalism, theft, negligence, or inadequate maintenance following the 90-day maintenance period.

PART 2 PRODUCTS

2.1 GENERAL

A. The following organic and soil amendments and fertilizer are to be used for bidding price basis only. Specific amendments and fertilizer specifications will be made after grading operations are complete and samples are tested by the Contractor.

B. All materials shall be of standard, approved and first-grade quality and shall be in prime condition when installed and accepted. Any commercially processed or packaged material shall be delivered to the site in the original unopened container bearing the manufacturer's guaranteed analysis. Contractor shall supply Architect with a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance or bearing the manufacturer's analysis.

2.2 ORGANIC AMENDMENT

A. Nitrogen Stabilized: 0.56 to 0.94 N based on dry weight for composted fir or pine bark fines.

B. Particle Size: 95% – 100% passing 6.35 mm standard sieve. 64% passing 2.33 mm standard sieve.

C. Salinity: The saturation extract conductivity shall not exceed 3.5 millimhos/centimeter at 25°C as determined by saturation extract method.

D. Iron Content: Minimum .06 silute acid soluble Fe on dry weight basis.

2.3 SOIL AMENDMENT (as required by soil test)

A. Soil Sulphur: Agricultural sulfur containing a minimum of 99% sulphur (expressed as elemental).

B. Iron Sulfate: 20% iron (expressed as metallic iron), derived from ferric and ferrous sulphate, 10% sulphur (expressed as elemental).

C. Calcium Carbonate: 95% lime as derived from oyster shells.

D. Gypsum: Agricultural grade product containing 98% minimum calcium sulphate.

E. Dolomite Lime: Agricultural grade mineral soil conditioner containing 35% minimum magnesium carbonate and 49% minimum calcium carbonate, 100% passing #65 Kaiser Dolomite 65 AG or approved equal.

F. Calcium Nitrate: Agricultural grade containing 15.5% nitrogen.

2.4 FERTILIZER

A. Backfill fertilizer: Shall be Osmocote Controlled Release Formula (19-6-12, 4-month formula).

B. Soil Prep. Fertilizer: Shall be Simplot 6-20-20 MN Planting & Growing Food and shall consist of the following percents by weight:

6% nitrogen

20% phosphoric acid

20% potash

2.5 IMPORT SOIL

A. Fertile, friable, natural top loam, free of alkali, noxious week seed, admixtures of clay, subsoil rocks larger than 1-1/2" diameter, sticks, debris, detrimental to healthy plant growth, pH reading of not less than 6.5 or more than 7.5. Import when required, shall be obtained from source approved by Architect.

2.6 PLANT MATERIAL

A. Plants shall be in accordance with the California State Department of Agriculture's regulations for nursery inspections, rules, and rating. All plants shall have a normal habit of growth and shall be sound, healthy, vigorous, and free of insect infestations, plant diseases, sun scalds, fresh abrasions of the bark, excessive abrasions, or other objectionable disfigurements. Tree trunks shall be sturdy and well "hardened" off. All plants shall normally have well-developed branch systems and vigorous and fibrous root systems which are not root- or pot-bound. In the event of disagreement as to the condition of the root system, the root conditions of the plants furnished by the Contractor in containers will be determined by removal of earth from the roots of not less than two plants of each species or variety. Where container-grown plants are from several sources, the roots of not less than two plants of each species or variety from each source will be inspected. In case the sample plants inspected are found to be defective, the Architect is the sole judge as to acceptability. Any plants rendered unsuitable for planting because of this inspection will be considered as samples and will be provided at the expense of the Contractor.

B. The size of the plants will correspond with that normally expected for species and variety of commercially available nursery stock or as specified in the drawings. The minimum acceptable size of all plants, measured before pruning with the branches in normal position, shall conform with the measurements, if any, specified on the drawings in the list of plants to be furnished. Plants larger in size than specified may be used with approval of the Architect, but the use of larger plants will make no change in Contract price. If the use of larger plants is approved, the ball of earth or spread of roots for each plant will be increased proportionately.

C. All plants not conforming to the requirements herein specified, shall be considered defective and such plants, whether in place or not, shall be marked as rejected and immediately removed from the site of the work replaced with new plants at the Contractor's expense. The plants shall be of the species, variety, size, and condition specified herein or as shown on the drawings. Under no conditions will there be any substitution of plant or sizes listed on the accompanying plans, except with the expressed written consent of the Architect.

D. At no time shall trees or plant materials be pruned, trimmed, or topped prior to delivery and any alteration of the shape shall be conducted only with the approval and when in the presence of the Architect and as noted on the Planting Specifications.

E. Nursery Grown and Collected Stock:

1. Grown under climatic conditions like those in locality of project when possible.
2. Container-grown stock in vigorous, healthy condition, not root-bound or with root system hardened off.
3. Use only liner stock plant material which is well established in removable containers or formed homogenous soil sections.

F. Sod

1. Install sod as specified in the planting legend on the planting plan.

2.7 TREE STAKING MATERIAL

A. Stakes for tree support shall be wood stakes; lodge pole pine stakes full-length treated with copper naphthanate. Minimum nominal size: 2" in diameter x 8’ long and pointed at one end (adjust length to fit tree). Stakes shall be free from knots, checks, splits, or disfigurements.

B. Ties: "Tie-it super" tree tie by Arthur Enterprises, available at Normac.

2.8 BARK MULCH

A. Shredded Cedar bark mulch by Redi Gro or approved equal.

1. The mulch shall consist of fibrous, woody bark mixture of varied particle sizes.

2.9 PRE-EMERGENT WEED CONTROL

A. Oxadiazon, “Treeflan”, “Ronstar 2G”, “Surflan” (Elano Products Company), or approved equal.

2.10 ROOT BARIERS

A. NDS EP series root barrier panel, or equal.

1. EP-2450 24” L x 24” W

2.11 JUTE NETTING

A. Biodegradable jute fabric.

2.12 OTHER MATERIALS

A. Materials not specifically described but required for the complete and proper installation of the Work of this Section shall be as selected by the Contractor subject to the approval of the Architect.

PART 3 EXECUTION

3.1 GENERAL

A. Install materials in accordance with all the methods, techniques and specifications published by each representative manufacturer. All pertinent descriptive literature issued by any of these manufacturers forms a part of these specifications after approval.

3.2 WEED CONTROL

A. Irrigate the site normally for two weeks to germinate weeds. Apply contact herbicide per manufacturer recommendation. Repeat process if required by Architect.

1. If bermudagrass or crabgrass is present or there is a possibility that it is latent in the soil, this process must be repeated a minimum of three times prior to disturbance of soil. If irrigation is not present, this process must be conducted after installation of the irrigation system and before planting.
2. Eradication of crab grass and bermudagrass must be performed between the months of May and September unless authorized otherwise by the landscape architect.

3.3 LANDSCAPING GRADING

A. Backfill, Fill Soil: Prior to installation of any imported soil or backfill, gravel fill or sub-base, inspect integrity of waterproofing and dampproofing membranes and for satisfactory correction of any defects which might affect the performance of the above membranes prior to proceeding.

B. Rip subgrade in two directions to a depth of 12” prior to placement of topsoil.

C. Import Soil: Import additional topsoil only as required to bring planting areas up to finish grade, of quality specified herein. Spread and cultivate topsoil so no settling takes place at any time.

D. Landscape Fine Grading: Resieve previously prepared areas rough graded to within about 1/10’ of finish grade unless otherwise instructed. Bring areas to finish grades indicated, anticipating soil conditioners and amendments. Grades not specifically indicated to be as follows:

1. 2" below adjacent paving, curbs, and mowing strips for sod lawn.
2. 1" below adjacent paving, curbs, and mowing strips for hydroseed lawn.
3. 2" below adjacent paving, curbs and mowing strips for shrubs and groundcover beds.

E. Jute Netting – Jute netting shall be installed on all slopes exceeding 2 ½:1. Netting shall be laid perpendicular to the contours, overlapping min. 6” and secured with staples @ 4’ o.c.

3.4 INSPECTION

A. Verify that final rough grades (=.2 of finish grade) have been established prior to beginning planting operations. Inspect trees, shrubs and liner stock plant material for injury, insect infestation and trees and

shrubs for improper pruning. Do not begin planting trees until deficiencies are corrected or plants replaced.

3.5 PREPARATION

A. The irrigation system shall be operational and approved prior to planting.

3.6 INSTALLATION

A. Preparation of Planting Areas

1. After the approximate finished grades have been established, soil shall be conditioned and fertilized in the following manner. Nitrogen stabilized organic amendment and Planting & Growing Food shall be uniformly spread and cultivated thoroughly by means of mechanical tiller into the top 6" of soil.
2. The following organic, soil amendments and fertilizer rates and quantities are to be used for bidding basis only. Specific planting specifications will be made following rough grading operations are complete and soil samples are tested by Contractor.
    a. Application Rates:
        1) Nitrogen stabilized organic amendment - 6 cu. yds. per 1,000 sq. ft.
            a) If the lab recommends less than 6 cu. yds. Per 1,000 sq. ft., the excess bid amount shall be applied to the cost of any additional soil improvements or returned to the Owner as a credit.
        2) Simplot 6-20-20 MN Planting & Growing Food -30 lbs. per 1,000 sq. ft. for shrub and ground cover areas, 20 lbs. per 1,000 sq. ft. for lawn areas.
3. NOTE: Contractor shall ensure that iron sulfate does not contact walks, walls, or other landscape surfaces. All stains on these surfaces, because of iron sulfate overthrow, will be the responsibility of the Contractor.
4. All soil areas shall be compacted and settled by application of heavy irrigation to a minimum depth of 12”.
5. At the time of planting, the top 2” of all areas to be planted or seeded shall be free of stones, stumps or other deleterious matter 1" in diameter or larger and shall be free from all wire, plaster or similar objects that would be a hindrance to planting or maintenance.

B. Final Grades:

1. After the foregoing specified deep watering, minor modifications to grade may be required to establish the final grade. These areas shall not be worked until the moisture content has been reduced to a point where working it will not destroy soil structure.
2. Finish grading shall ensure proper drainage of landscape areas. All surface drainage shall be away from all building foundations.

C. Disposal of Excess Soil: Dispose of unacceptable or unused excess soil.

3.7 PLANTING INSTALLATION

A. General

1. Actual planting shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice, as approved by the Architect.
2. Only as many plants as can be planted and watered on that same day shall be distributed in the planting area.

3. Containers shall be opened, and plants shall be removed in such a manner that the ball of earth surrounding the roots is not broken and they shall be planted and watered as herein specified immediately after removal from the containers. Containers shall not be opened prior to placing the plants in the planting area.

B. Excavation for Planting

1. Shape:
   a. Vertical sides and flat bottom.
   b. Plant pits to be square for box material, circular for canned material.
2. Size: All trees shall have planting pits dug twice the diameter of the root ball. The depth of the planting pits shall be equal to the depth of the root ball. Backfill around the root ball with prepared backfill mix.
3. Protect all areas from excessive truck or equipment compaction when offloading plants or other material directly in the planting areas.
4. Can Removal:
   a. Cut cans on two sides with an acceptable can cutter.
   b. Do not injure the root ball.
   c. Do not cut cans with spade or ax.
   d. Carefully remove plants without injury or damage to the root ball.
   e. After removing the plant, superficially cut the edge roots with knife on three sides.
5. Box Removal:
   a. Remove the bottom of plant boxes before planting.
   b. Remove sides of box without damage to root ball after positioning plant and partially backfilling.
6. Setting Plants:
   a. Center plant in pit or trench.
   b. Face plants with fullest growth into prevailing wind, (or as otherwise directed by Architect).
   c. Set plant plumb and hold rigidly in position until soil has been tamped firmly around ball or roots. Crown of rootball shall be set 1-1/2" higher than adjacent finish grade.
7. Backfilling
   a. Container plants shall be backfilled with:
      1) Six parts by volume Native soil
      2) Four parts by volume soil amendment
      3) Osmocote Controlled Release per manufacturer's recommendations.
   b. All plants which settle deeper than specified above shall be raised to the correct level. After the plant has been placed, additional backfill shall be added to the hole to cover approximately one-half of the height of the root ball. Water thoroughly to saturate root ball and adjacent soil.
   c. Add remaining backfill to bring up to grade, foot tamp and water thoroughly to remove all air pockets.
   d. The preceding is for bid basis only and specific backfill specifications will be made after rough grading operations are complete and soil samples are tested by the Contractor.
8. Watering basins:

a. After backfilling, an earthen basin shall be constructed around each plant. Each basin shall be of a depth sufficient to hold at least 2” of water. Basins shall be of a size suitable for the individual plant. In no case shall the basin for a fifteen-gallon plant be less than 4’ in diameter, five-gallon plants less than 3’ in diameter and a one-gallon plant less than 2’ in diameter. The basins shall be constructed of amended backfill material.

9. Pruning:

a. Pruning shall be limited to the minimum necessary to remove injured twigs and branches to compensate for loss of roots during transplanting, but never to exceed one-third of the branching structure. Upon approval of the Architect, pruning may be done before delivery of plant, but not before plants have been inspected and approved.

10. Staking:

a. Staking of all trees shall conform to tree staking details.

C. Planting of Groundcovers:

1. Groundcover plants shall be grown in one-gallon containers, flats, peat pots or taken as cuttings, as indicated on the plans. Flat grown plants (rooted cuttings) shall remain in those flats until transplanting. The flat's soil shall contain sufficient moisture so that it will not fall apart when lifting the plants. If plants from peat pots are used, the pots shall be always protected prior to planting to prevent unnecessary drying of the root ball.

2. Groundcover shall be planted in straight rows and evenly triangularly spaced, unless otherwise noted and at intervals called out in the drawing.

3. Each rooted plant shall be planted with its proportionate amount of flat soil or in a peat pot, in a manner that will ensure minimum disturbance of the root system, but in no case shall this depth be less than two nodes. To avoid drying out, plantings shall be immediately irrigated after planting until the entire area is soaked to the full depth of each hole, unless otherwise noted in the drawings.

4. Care shall be exercised always to protect the plants after planting. Any damage to plants by trampling or other operations of this Contract shall be repaired immediately.

D. PRE-EMERGENT

1. After soil preparation, planting and finish grade, Contractor shall apply a pre-emergent herbicide at manufacturer's recommended rate prior to placement of bark mulch in shrub and ground cover areas only.

E. BARK MULCH

1. Top Dressing (Ground Cover Areas): Apply 3" layer (9 yds. per 1,000 sq. ft.) of Shredded Cedar ‘Walk-On’ bark mulch in all planting areas. Do not apply bark top dressing on slopes if 2-1/2:1 or greater.

F. Sod Planting

1. Planting Soil: Remove rocks, weeds, debris from area to be sodded. Work up soil to a depth of 6” and break up all clods. Soil prep all areas as noted elsewhere in specifications. Apply and rototill soil amendment and fertilizer as specified in Section 3.8, A.1 and 2.

2. Grading and Rolling: Carefully smooth all surfaces to be sodded. Roll area to exposed soil depressions or surface irregularities. Regrade as required.

3. Laying Sod: Lay first strip of sod slabs along a straight line (use a string in irregular areas). Butt joints tightly, do not overlap edges. On the second strip, stagger joints much as in laying bricks. Use a sharp knife to cut sod to fit curves, edges, sprinkler heads.

4. Watering: Do not lay the whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and water.
5. Rolling Sod: After laying all sod, roll lightly to eliminate irregularities and to form good contact between sod and soil. Avoid a very heavy roller or excessive initial watering which may cause roller marks.
6. Irrigation: Water thoroughly the completed lawn surface. Soil should be moistened at least 8” deep. Repeat sprinkling at regular intervals to always keep sod moist until rooted. After sod is established, decrease frequency, and increase amount of water per application as necessary.
7. Replacement: Replace all dead or dying sod with equal material as directed by Architect.
8. Maintain a minimum distance of 18” between the edge of lawn and trunk of trees.

3.8 ROOT BARRIER INSTALLATION

A. Install root barriers where trees are planted within 48 inches (48”) of paving or other hardscape elements such as walls, curbs, and walkways.

B. Align root barrier adjacent to the paving or other hardscape element to protect from invasive roots.

C. Install barrier continuously for 8’ in each direction from the tree trunk for an overall distance of 16’. If the trees are spaced closer, use a single continuous piece of root barrier.

1. Position root barrier 2” below finish grade.
2. Do not distort or bend root barrier during construction activities.
3. Do not install root barrier surrounding the root ball of the tree.

3.9 CLEAN UP

A. After all planting operations have been completed, remove all trash, excess soil, empty plant containers or rubbish from the property. All scars, ruts or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout the site. Clean-up contractor shall pick up all trash resulting from this work no less frequently than each Friday before leaving the site, once a week and/or the last working day each week. All trash shall be removed completely from the site. The Contractor shall leave the site area broom clean and shall wash down all paved areas within the Contract area, leaving the premises in a clean condition. Condition acceptable to Owner and Architect.

3.10 OBSERVATION SCHEDULE

A. Normal progress inspection shall be requested by the Contractor from the Architect at least 48 hours in advance of an anticipated site visit according to the indicated required observation schedule as follows:

1. Final grade review, plant inspection – 48 hours
2. Pre-maintenance – seven days
3. Final walk-through – seven days

B. No site visits shall commence without all items noted in previous Observation Reports either completed or remedied unless such compliance has been waived by the Owner. Failure to accomplish punch list tasks or prepare adequately for desired inspections shall make the Contractor responsible for reimbursing the Architect at his current billing rates per hour (plus transportation costs). No further inspections shall be scheduled until this charge has been paid and received.

3.11 START OF LANDSCAPE MAINTENANCE PERIOD

A. The landscape Maintenance Period does not start until all work is installed as determined by the Architect, in writing.

B. An on-site inspection by the Architect, Project Inspector and Owner is required to determine the date of the start of the Landscape Maintenance Period. The contractor must request date and time of this on-site meeting 48 hours in advance. The contractor must also be in attendance.

C. Work requiring corrective action or replacement, in the judgement of the Architect, shall be performed within ten days after final inspection. Corrective work shall be done at no additional cost to the Owner.

3.12 DURATION OF LANDSCAPE MAINTENANCE PERIOD

A. The Landscape Maintenance Period shall continue for a minimum of 90 calendar days. During this time, the Contractor shall continuously maintain all areas involved in this Contract until final acceptance of the work by the Owner. Improper maintenance or possible poor condition of any planting at the termination of the scheduled maintenance period may cause postponement of the completion date of the Contract. Maintenance shall be continued by the Contractor until all work is acceptable. To carry out the plant maintenance work, the Contractor shall furnish sufficient men and adequate equipment to perform the work during the maintenance period.

B. All planting areas shall be weeded. All planting and seeding shall be kept in a healthy growing condition by watering, weeding, cultivation, pruning, mowing, edging, spraying, fertilizing and by performing any other necessary operation of Maintenance. Failure to comply will result in an extension of the Landscape Maintenance Period, as determined by the Architect.

3.13 MAINTENANCE – SPRINKLER IRRIGATION SYSTEM

A. The contractor shall check all systems weekly for proper operation. Lateral lines shall be flushed out after removing the last sprinkler head or two at each end of the lateral. All heads are to be adjusted as necessary for unimpeded coverage.

B. Set and program automatic controllers for seasonal water requirements. Give Owner's Representative a key to controllers and instructions on how to turn off system in case of emergency.

C. Repair all damage to sprinkler irrigation system at Contractor's expense. Repairs shall be made within one watering period or one week, whichever is the shortest time.

3.14 MAINTENANCE – TURF AREAS

A. Mowing of turf will commence when the grass has reached a height of 3”. The height of cut will be 2”. Mowing will be at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds to the satisfaction of the Architect prior to final acceptance.

B. All grass clippings shall be picked up and removed from the site and premises.

C. Edges shall be trimmed at least twice monthly or as needed for a neat appearance. Clippings shall either be vacuumed or blown off walks.

D. Lawns shall be watered at such frequency as weather conditions require replenishing soil moisture below root zone without drying out. Normally, a total of 1-1/2” of water is needed weekly in hot weather.

E. Fertilize the lawn areas at the start of the Landscape Maintenance Period and every 30 days thereafter, with 16-6-8, at the rate of 6 lbs. per 1,000 sq. ft., unless otherwise directed.

3.15 MAINTENANCE – TREES AND SHRUBS

A. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.

B. Maintain and reconstruct water basins around plants as necessary.

C. Do not prune unless directed to by Architect.

D. Re-stake and re-tie trees as needed and as directed by the Architect.

E. Replace any dead, dying, or vandalized plant material on a weekly basis throughout the maintenance period.

3.16 MAINTENANCE – INSECT AND HERBICIDE APPLICATION

A. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal, Balan or Betasan for control prior to crabgrass germination. Control insect pests if necessary.

B. Material, timing, rate of application and application shall be by a licensed Pest Control Operator.

END OF SECTION 32 90 00

SECTION 32 92 00 TURF AND GRASSES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Sodding.
2. Turf renovation.

B. Related Sections:
1. Section 32 84 23: Irrigation.
2. Section 32 90 00: Planting.
3. Section 32 93 00: Plants.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete or the top surface of a fill or backfill before planting soil is placed.

1.4 SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed - From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging:
1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific

to Project.

E. Sustainable Design Submittals:
1. Credit MR 5: Product Data for regional materials indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.

1.5 QUALITY ASSURANCE

A. Installer Qualifications - A qualified landscape installer whose work has resulted in successful turf establishment:
1. Experience: Five years' experience in turf installations similar in material and extent to that indicated for this project, and a record of successful landscape establishment, in addition to requirements in Section 01 40 00: Quality Requirements.
2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
3. Pesticide Applicator: State licensed, commercial.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

PART 2 PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

2.2 TURFGRASS SOD

A. Turfgrass Sod - Certified, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted:
1. Sod shall be well-rooted, containing a growth of not more than 3 percent of other undesirable grass species or weed species. The turf shall be of sufficient density so that no surface soil is visible when mowed to a height of 1.5 inches. The thickness of the soil portion of the sod shall not exceed .60 inch.

B. Turfgrass Species: Turf-type tall fescue blend (Festuca arundinacea), shade tolerant blend.

2.3 FERTILIZERS

A. Commercial Fertilizer - Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

B. Slow-Release Fertilizer - Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.4 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Retain "Planting Restrictions" Paragraph below to restrict planting times:
   1. Planting Restrictions: Sodding of permanent lawns to occur from March 15 through November 30. Sodding operations at other times shall be only with the approval of the Owner’s Representative and at the Contractor’s risk.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

3.2 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work:
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   3. Uniformly moisten excessively dry soil that is not workable, or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.3 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations:
   1. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil- bearing water runoff or airborne dust to adjacent properties and walkways.

3.4 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to Landscape Architect directive.

B. Placing Planting Soil - Place planting soil in place over exposed subgrade:
   1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.5 SODDING

A. Lay sod within 24 hours of harvesting unless a suitable preservation method is accepted by Architect prior to delivery time. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass:
   1. Lay sod across slopes exceeding 1:3.
   2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

3.6 TURF RENOVATION

A. Renovate existing turf where indicated.

B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles:
   1. Reestablish turf where settlement or washouts occur or where minor regrading is required.

2. Install new planting soil as required.

C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches (150 mm).

H. Apply initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches (100 mm) of existing soil. Install new planting soil to fill low spots and meet finish grades.

I. Apply sod as required for new turf.

J. Water newly planted areas and keep moist until new turf is established.

3.7 TURF MAINTENANCE

A. General - Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation:
   1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
   2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
   3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering - Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm):
   1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
   2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.

C. Turf Post-fertilization - Apply slow-release fertilizer after initial mowing and when grass is dry:
   1. Use fertilizer that provides actual nitrogen of at least 1 lb./1000 sq. ft. (0.45 kg/92.9 sq. m) to turf area.

3.8 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:
   1. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and

surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.9 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already- germinated weeds and according to manufacturer's written recommendations.

3.10 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove non-degradable erosion-control measures after grass establishment period.

3.11 MAINTENANCE SERVICE

A. Turf Maintenance Service - Provide full maintenance by skilled employees of landscape installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:
   1. Sodded Turf: 60 days from date of planting completion.

END OF SECTION 32 92 00

SECTION 32 94 13 TREE ROOT BARRIER

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Furnishing and installation of Tree Root Barrier

B. Related Sections:
   1. Division 32 – Exterior Improvements

1.3 DEFINITIONS

A. Tree Root Barrier: Plastic mechanical barrier in modular panels used to redirect and guide tree roots down and away from hardscape surfaces.

B. Linear Application: Installation method of Tree Root Barrier, used in a straight line along the hardscape to be protected.

C. Surround Application: Installation method of Tree Root Barrier, surrounding a planting area perimeter.

D. Root Pruning Application: Installation method of Tree Root Barrier, used for existing trees in planting areas where existing roots must be severed for installation.

1.4 SUBMITTALS

A. Product data: Manufacturers standard literature defining materials for use on the Project.

B. Samples, if required by Architect:
   1. Tree root barrier: One full length panel.

C. Quality control: Complete installation instructions specified, may be combined with product data.

1.5 QUALITY ASSURANCE

A. Manufacturer’s qualifications:
   1. Minimum twenty-five (25) years experience in tree and plant protection.

1.6 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping
   1. Provide materials in original, unopened containers with manufacturer’s labels intact and legible.

B. Acceptance at Site
   1. Damaged materials will not be accepted, as determined by visual inspection.

2. Rejected materials shall be removed from project site immediately.

C. Storage and Protection
1. Store materials in dry area in manufacturer's protective packaging, in original containers with labels and instructions intact.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers:
1. Products specified as standard of quality are manufactured by DeepRoot Green Infrastructure, LLC. (DeepRoot), 530 Washington Street, San Francisco, CA 94111; 800.458.7668; fax 800.277.7668; www.deeproot.com
2. Products meeting standards listed within this specification may be acceptable for use subject to approval of product list and samples.

2.2 MANUFACTURED UNITS

A. Tree Root Barrier
1. 18" Depth, UB 18-2
   a. Material: black, recyclable, injection molded panel manufactured with 75% reprocessed polypropylene with added ultraviolet inhibitors.
   b. Dimensions: 0.075" (1.90 mm) wall thickness in modules 24" (609 mm) long and 18" (457 mm) deep.
   c. Additional specifications:
      1) 3/8" (9.53mm) wide integral molded 0.060" (1.52mm) thickness double top edge with stiffening ribs; bottom edge attached to vertical root deflecting ribs.
      2) Integral molded vertical root directing ribs; 0.060" (1.52mm) thickness by 1/2" (12.7mm) deep spaced at 6" (152mm) O.C.
      3) Integral molded horizontal anti-lift ground lock tabs; 0.060" (1.52mm) thickness by 2-1/4" (57.15mm) long by 3/8" (9.53mm) wide; minimum nine per panel.
      4) Integral zipper joining system for panel connections.

PART 3 INSTALLATION

3.1 EXAMINATION

A. Verification of conditions
1. Verify other work in other sections is complete in order to minimize site impacts by installation of tree root barrier.
2. Any damage to site work due to installation of tree root barrier shall be repaired at the expense of the Contractor.

3.2 LINEAR APPLICATIONS

A. For installation along linear applications of hardscapes:
1. Assemble the appropriate number of root barrier panels using Zipper Joining System.
2. Trench immediately adjacent to hardscape to the appropriate depth for installation of specified root barrier so that top of barrier is ½"-1" (12.7mm to 25.4mm) above finished soil grade.
3. Place root barrier in trench, vertical ribs facing toward planting area and tree roots.
4. Where possible, use hardscape as a guide for root barrier alignment.

5. Backfill adjacent planting soil against the root barrier to promote clean fit to hardscape. Fill to finish grade per project specifications.

END OF SECTION 32 94 13

SECTION 33 00 00

SITE UTILITIES

PART 1 - GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.2 SCOPE OF WORK

A. The work includes, but is not necessarily limited to, the following:
   1. Domestic water piping system.
   2. Fire protection piping systems.
   3. Sewer piping system.

B. Other items that may be specified or shown on the Drawings.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 50 00, Construction Facilities and Temporary Controls.

B. Section 31 23 33, Trenching and Backfilling.

C. Section 32 16 00, Site Concrete.

D. Section 33 00 00, Earthwork.

E. Section 31 31 00, Soil Treatment

1.4 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
   1. Sun damaged or discolored PVC pipe will be rejected.

B. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

C. The representatives of the Owner’s testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner’s testing lab representatives nor the testing by the Owner’s testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.

D. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.

E. Per 2022 NFPA 13 provide Contractor's material and test certificate to the Owner, Architect,

Project Inspector and Local Fire Authority.

1.5 SUBMITTALS

A. Manufacturer's Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.

C. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 FEES, PERMITS, AND UTILITY SERVICES

A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.

B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.7 WARRANTY

A. Refer to General Conditions and Section 01 78 36.

1.8 REFERENCES AND STANDARDS

A. ANSI/ASTM D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

B. ANSI/ASTM D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ANSI/ASTM D1557-02 - 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.

D. ANSI/ASTM D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).

E. ANSI/ASTM D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

H. Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.

I. NFPA 13, 24 and 25, latest editions.

J. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.

K. California Plumbing Code, latest edition.

1.9 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

B. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this Section and that arrangements have been made to properly store, handle and protect such materials and work.

1.10 PROJECT CONDITIONS

A. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 EXISTING SITE CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullying of sides of excavation.

E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.

C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.

D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6” dia. 12” deep, flush with finish grade at the ends of all stubbed pipes.

PART 2 – PRODUCTS

2.1 MATERIALS - GENERAL

A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment.

B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.

C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.

D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.
   1. For the purposes of this section, “lead free” means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
   2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.2 VALVE BOXES

A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT,

concrete valve box with cover marked for service, domestic water shall be marked “Water” and fire supply shall be marked “Fire”. Furnish extension handles for each size square nut valve, and provide “fork” handle for each size of “wheel handle” valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.3 PIPES AND FITTINGS

A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.

B. Domestic water Lines 3 1/2” and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC.

C. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.

D. Pipe Insulation; Pipe exposed to atmospheric conditions ½” thru 4” NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.

E. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
   1. Finish shall be flat mill finish
   2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee’s, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
   3. The fittings shall be composed of 2-pieces
   4. Adhesives; per the manufacturers requirements
   5. Joint Sealant; shall be silicone, and shall be aluminum in color.

2.4 CLEANOUTS

A. Cleanouts of same diameter as pipe up to 8” in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18” from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.

B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.5 UNIONS

A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½” to 3”.

B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe:	150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing:	Brass ground joint with sweat connections.
PVC Sch 80 pipe:	PVC union, FIPT X FIPT

2.6 VALVES

A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.

B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.

C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.

D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.7 SERVICE SADDLES

A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.8 TRACER WIRE

A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.

B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.

C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.

D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.

E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over or under such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

A. Excavation and Bedding:
   1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
   2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
   3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.
      a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:
   1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell upgrade, true to line and grade.
      a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner’s Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than ¼” depression shall result.
      b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
      c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
   2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.

C. Backfilling:
   1. General: Do not start backfill operations until required testing has been accomplished.

2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 23 33 – TRENCHING AND BACKFILLING.
3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

A. The contractor shall be responsible for determining the installed depth of all water piping, based on surfaces grades and minimum required depth of cover.

B. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

C. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.

D. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2022 NFPA 24, 10.4.1.1.

E. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.

F. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.

G. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.

H. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.

B. Drain and flush piping to remove grease and foreign matter.

C. Sewer piping shall be balled and flushed.

D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.

3.7 SEWER INTERNAL INSPECTIONS

A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.

B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.

C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
1. The pipe shall be pressure tested and per the test schedule.
2. The pipe shall be pressure tested down within the trench.
3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminates within the trench.
7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1part chlorine to 4 parts potable water.
8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

System Tested	Test Pressure PSIG Test With
Private domestic water piping and fire mains serving fire hydrants:	150 Lbs. Water 4 hrs.
Fire Protection Piping from	

PIV to fire riser:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements

B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
   1. Clean and disinfect industrial water system in addition to the domestic water system.
   2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.

C. Domestic water sterilization shall be performed by a licensed “qualified applicator” as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.

D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.

E. Contractor to provide a 1” service valve connected to the system at a point within 2’-0” of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.

F. Sterilization Procedure to be as follows:
   1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.
   2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
   3. Provide sign at all outlets which reads “Water Sterilization in Progress – Do not operate”. Remove signs at conclusion of test.
   4. Close all outlets and valves, including valve connecting to water supply line and 1” service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
   5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.

G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.

H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.

I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION 33 00 00

SECTION 33 40 00 SITE DRAINAGE

PART 1 - GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 50 00, Construction Facilities and Temporary Controls.

B. Section 31 23 33, Trenching and Backfilling.

C. Section 32 12 00, Asphalt Concrete Paving.

D. Section 32 16 00, Site Concrete

1.3 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

C. The representatives of the Owner’s testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner’s testing lab representatives nor the testing by the Owner’s testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.

D. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.

1.4 SUBMITTALS

A. Refer to Section 01 33 00.

B. Manufacturer's Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

1.5 WARRANTY

A. Refer to General Conditions and Section 01 78 36.

1.6 REFERENCES AND STANDARDS

A. ANSI/ASTM D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

B. ANSI/ASTM D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ANSI/ASTM D1557-02 - 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.

D. ANSI/ASTM D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).

E. ANSI/ASTM D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

H. Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.

I. California Plumbing Code current edition.

1.7 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

B. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this Section and that arrangements have been made to properly store, handle and protect such materials and work.

1.8 PROJECT CONDITIONS

A. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.9 EXISTING SITE CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.10 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the Geotechnical

Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullying of sides of excavation.

E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

H. Trees: Carefully protect existing trees that are to remain.

1.11 SEASONAL LIMITS

A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.12 TESTING

A. General: Refer to Section 01 40 00 – Quality Requirements.

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.13 RECORD DRAWINGS

A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.

C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.

D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe: Use one of the following, unless noted on the Drawings otherwise.

1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212. Sun damaged pipe will be rejected.
2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe and water tight per ASTM D3212 with dual wall water tight gasket fittings.

B. Drop Inlet: Shall be as shown on the drawing details.

C. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.

D. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.

E. Area Drains: Shall be as shown on the drawing details.

F. Clean-outs: Shall be as shown on the drawing details.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence

B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

C. Verify that specified items may be installed in accordance with the approved design.

D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION

A. General: Installation shall be in strict conformance with referenced standards, the manufacturer’s written directions, as shown on the drawings and as herein specified.

B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.

C. Excavation and Bedding:
1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer’s recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
   a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:
   1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
   2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
   3. Pipe shall be bedded uniformly throughout its length.
   4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
   5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:
   1. General: Do not start backfill operations until required testing has been accomplished.
   2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 23 33 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates
   1. In landscape and lawn areas +- 0.05’.
   2. In sidewalk and asphalt pavement +-0.025’.
   3. In curb and gutter application +-0.0125’.

B. Cleanout Boxes and Lids
   1. In landscape areas; 0.10 higher than surrounding finish grade, +-0.05’.
   2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, +-0.025’.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

B. If the previously excavated material from trenching is too wet to achieve trench backfill compaction the contractor shall make a reasonable effort to aerate and dry the material per section 31 00 00, 3.08, B

3.5 FLUSHING

A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

A. Refer to Section 01 74 00.

B. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

C. Clean the dirt, rocks, and debris from all storm drain inlets, structures, and connecting pipes.

END OF SECTION 33 40 00