

SAN DIEGO UNIFIED SCHOOL DISTRICT

FACILITIES PLANNING AND CONSTRUCTION



2351 Cardinal Lane, Building M, San Diego, CA 92123

BID NO. CP25-1029-52-00-00

**FURNISH AND INSTALL WALK-IN FREEZERS
AT BELL MIDDLE SCHOOL AND
CLAIREMONT HIGH SCHOOL**

ADVERTISEMENT DATES:

**APRIL 8, 2025
APRIL 15, 2025**

NOTICE TO CONTRACTORS CALLING FOR BIDS

DISTRICT: SAN DIEGO UNIFIED SCHOOL DISTRICT

PROJECT DESCRIPTION: FURNISH AND INSTALL WALK-IN FREEZERS AT BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL

DATE/TIME FOR SUBMITTAL OF BID PROPOSAL: 1:00 PM ON MAY 1, 2025

PLACE FOR SUBMITTAL OF BID PROPOSALS: ELECTRONIC-ONLY BID MUST BE SUBMITTED VIA PLANETBIDS. GO TO:

tinyurl.com/SDUSD-PlanetBids

THEN SEARCH UNDER “BID OPPORTUNITIES” FOR “INVITATION NUMBER” CP25-1029-52-00-00 FURNISH AND INSTALL WALK-IN FREEZERS AT BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL. FOR NEW VENDORS, PLEASE REGISTER UNDER “NEW VENDOR REGISTRATION.”

BID AND CONTRACT DOCUMENTS AVAILABLE AT:

CRISP IMAGING
9240 TRADE PLACE, SUITE 300
SAN DIEGO, CA 92126
(858) 535-0607
Download free of charge at: sandiegousdplans.com

MANDATORY SITE VISIT:

PRE-REGISTER WITH THE DISTRICT PRIOR TO ATTENDING THE SITE WALK AT
sandiegounified.org/sitewalks.

9:00 AM ON APRIL 17, 2025
THE MEETING LOCATION AT EACH SITE IS OUTSIDE THE MAIN OFFICE:

SITE VISITS		
Time	Site	Address
9:00 AM	Bell Middle School	620 Briarwood Rd, San Diego, CA 92139
Immediately after Bell Middle School	Clairemont High School	4150 Ute Dr, San Diego, CA 92117

ADDRESS:

FACILITIES PLANNING AND CONSTRUCTION
2351 CARDINAL LANE, BLDG. M
SAN DIEGO, CALIFORNIA 92123

NOTICE IS HEREBY GIVEN that the above-named California Public School District, acting by and through its Board of Education, hereinafter “the District” will receive up to, but not later than the above-stated date and time, sealed Bid Proposals for the Contract for the Work of the Project generally described as

NO. CP25-1029-52-00-00 – FURNISH AND INSTALL WALK-IN FREEZERS AT BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL

Advertisement for Bids

Notice is hereby given that the San Diego Unified School District, acting by and through its governing board, will electronically receive bids for the furnishing of all labor, materials, transportation, equipment, and services for:

CP25-1029-52-00-00 WALK-IN FREEZERS AT BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL

A mandatory site visit is scheduled for 9:00 a.m. on THURSDAY, APRIL 17, 2025, outside the main office of **Bell Middle School**, 620 Briarwood Road, San Diego, CA 92139. Upon completion of the first site, contractors shall proceed immediately to **Clairemont High School**, 4150 Ute Drive, San Diego, CA 92117.

Prime contractors must be present at both sites in order to bid this project. All attendees must preregister with the District prior to attending the site walk at sandiegounified.org/sitewalks.

All bids must be received electronically via PlanetBids before **1:00 p.m. on THURSDAY, MAY 1, 2025**. Prime contractors interested in submitting a bid must go to tinyurl.com/SDUSD-PlanetBids, then search under "Bid Opportunities" for "Invitation number" CP25-1029-52-00-00 Walk-In Freezers at Bell Middle School and Clairemont High School. For new vendors, please register under "New Vendor Registration."

The project estimate is between **\$530,000 and \$740,000**, inclusive of allowances. This is not a PSA project but requires the District's prequalification for projects estimated **under \$1 million**. The District requires that Bidders possess any of the following classification(s) of California State Contractors License(s), valid and in good standing, at the time of bid opening and contract award: **B, or other appropriate license, subject to District approval**.

BID AND CONTRACT DOCUMENTS: The Bid and Contract Documents may be downloaded free of charge at the District's online Planroom at sandiegousdplans.com (click on Public Jobs to view all current bids). Contractors may purchase printed documents beginning April 8, 2025, at Crisp Imaging, 9240 Trade Place, Suite 300, San Diego, CA 92126, 858-535-0607, for a refundable deposit of Two Hundred Dollars (\$200.00) per set or USB drives for a non-refundable payment (\$2 - \$10). Deposits shall be made by check payable to San Diego Unified School District. If Bid and Contract Documents, including addenda, are returned intact and in good order to Crisp Imaging within ten (10) days of the issuance of the Final Bid Tabulation, the check will be returned.

BID REQUIREMENTS: Each bid shall be in accordance with all terms, conditions, plans, specifications, drawings, and any other documents that comprise the bid package and shall be submitted on the bid forms provided in PlanetBids. Under Public Contract Code section 20111(b)(1), bids shall be accompanied by a satisfactory bid security in the form of either a bid bond executed by the bidder and a surety company or a certified or cashier's check in favor of the San Diego Unified School District, in an amount equal to ten percent (10%) of the bid value.

PREQUALIFICATION OF BIDDERS: Pursuant to Public Contract Code 20111.5, the District is prequalifying prospective bidders; all prime contractors must be prequalified in order to submit a bid. If your company is already prequalified with the District through PlanetBids as a prime or MEP subcontractor, as a painter, or through our JOC program, you do not need to complete the under \$1 million prequalification application. If you are not prequalified, go to www.sandiegounified.org/prime-prequalification to submit an application. Completed applications must be submitted to the District no later than April 24, 2025, 5 business days before the bid opening. Applications submitted after this deadline will not be processed for this bid.

SENATE BILL (SB) 854 REQUIREMENTS: No contractor or subcontractor may be listed on a bid proposal or awarded a contract for a public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code §1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code §1771.1(a)]. This project is subject to compliance monitoring and enforcement by the DIR. Prime contractors must add the DIR Registration Number for each of their listed subcontractors to the Subcontractors List.

PREVAILING WAGES: Prevailing wage requirements apply to all public works projects and must be followed per Article 17 of the General Conditions of this bid. The applicable wage determination for this contract is 2025-1 and will be 2025-1 for the duration of the contract. This includes amendments, change orders, and warranty work relating to this contract number. The following is a link to the Department of Industrial Relations website to obtain rate information, and any applicable predetermined increases www.dir.ca.gov/oprl/dprevagedetermination.htm.

DISABLED VETERAN BUSINESS (DVB) PARTICIPATION PROGRAM: Pursuant to a board-approved resolution, the Bidder is required to satisfy a minimum DVB participation percentage of at least three percent (3%) for this project.

WITHDRAWAL OF BID PROPOSALS: Bids may not be withdrawn by any bidder for a period of **ninety (90) days** after the electronic opening of bids. During this time, bidders shall guarantee prices quoted in their respective bid submissions. A successful bidder shall not be relieved of the bid submitted without the District's consent or bidder's recourse to Public Contract Code §5100 et seq. For information regarding bidding, please email jimperial@sandi.net.

SAN DIEGO UNIFIED SCHOOL DISTRICT
George A. Harris III
Director, Fiscal Controls and Information Systems
Facilities Planning and Construction

Advertisement Dates:
April 8, 2025
April 15, 2025
CP25-1029-52-00-00

REQUIRED EXECUTABLE DOCUMENTS AND TIMELINE**(NOTE: This listing does not contain all the documents required during the construction phase)****THE FOLLOWING DOCUMENTS MUST BE COMPLETED AND
SIGNED AT TIME OF BID OPENING**

<u>DESCRIPTION</u>	<u>PAGE NUMBER</u>
Bid Proposal	E-1
Subcontractors List	E-4
Non-Collusion Declaration	E-6
Bid Security Bond or cashier's check	E-7
DVB Bidder Declaration	E-23

**THE FOLLOWING DOCUMENTS MUST BE COMPLETED AND SUBMITTED
WITHIN TWENTY-FOUR (24) HOURS AFTER BID OPENING**

Completed Subcontractors List	E-4
Completed DVB Bidder Declaration	E-23

**THE FOLLOWING DOCUMENTS MUST BE COMPLETED, SIGNED, AND SUBMITTED
WITHIN 3 BUSINESS DAYS AFTER WRITTEN NOTIFICATION**

Electronic Signature Acknowledgement & Agreement	E-8
Agreement	E-9
Certificate of Workers' Compensation Insurance	E-15
Drug-Free Workplace Certification	E-16
Guarantee	E-17
Contractor Certification Regarding Background Checks	E-18
List of Employees "Attachment A"	E-19

**THE FOLLOWING DOCUMENTS MUST BE COMPLETED, SIGNED AND SUBMITTED
WITHIN 5 BUSINESS DAYS AFTER WRITTEN NOTIFICATION**

Labor and Material Payment Bond	E-11
Performance Bond	E-13
Original Insurance Certificate(s) for General and Auto Liability and Workers' Compensation	

**THE FOLLOWING DOCUMENTS MUST BE COMPLETED AND SUBMITTED
WITHIN FIFTEEN (15) DAYS OF NOTICE TO PROCEED**

Schedule of Values, including Cost Breakdown to CM	See GC's Article 7.1
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**THE FOLLOWING DOCUMENTS MUST BE COMPLETED, SIGNED AND SUBMITTED
ON A MONTHLY BASIS (BY THE 5TH DAY OF EACH MONTH)**

Application for Progress Payment to Construction Office	See GC's Article 7.2
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*** NOTICE ***

**YOUR DEPOSIT FOR HARD COPY BID PACKAGES WILL BE
FORFEITED IF PLANS AND SPECIFICATIONS, INCLUDING
ALL ADDENDA, ARE NOT RETURNED IN GOOD CONDITION*
WITHIN**

TEN (10) CALENDAR DAYS

AFTER FINAL BID TABULATION IS ISSUED.

***Good condition is complete and bound, as it was
distributed. Moderate highlighting and markings are allowed.**

**If you are the apparent low bidder, or a listed subcontractor
to the apparent low bidder, please keep your plans and
contact Crisp Imaging to have your check released.**

DOCUMENT LIST
FOR
FURNISH AND INSTALL WALK-IN FREEZERS AT
BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL

Bid Documents

- Notice Calling For Bids
- Bid Advertisement
- Required Executable Documents and Timeline
- Instructions to Bidders
- Bid Proposal
- Subcontractors List
- Non-Collusion Declaration
- Bid Security Bond
- DVB Participation Program Overview and Resources & DVB Bidder Declaration

Contract Documents

- Electronic Signature Acknowledgement & Agreement
- Agreement
- Labor and Materials Payment Bond
- Performance Bond
- Workers Compensation Certificate
- Drug-Free Workplace Certification
- Guarantee
- Contractor Certification Regarding Background Checks
- List of Employees "Attachment A"
- General Conditions
- Supplementary Conditions
- Specifications
- Drawings

1. SUBMITTAL OF BID PROPOSALS

All Bid Proposals shall be submitted “**electronic-only**” based on the information supplied by Facilities Planning and Construction, located at 2351 Cardinal Lane, Building M., San Diego, CA 92123. Bid Proposals must conform with, and be responsive to, the Bid and Contract terms and conditions, specifications and plans, incorporated herein. Only Bid Proposals submitted through PlanetBids tinyurl.com/SDUSD-PlanetBids prior to the date and time set forth above for the electronic bid opening shall be considered.

2. BID PROPOSAL, SUBCONTRACTOR LIST, AND OTHER BID DOCUMENTS

All documents required at time of bid are included in the bid set and shall be attached to the electronic-only bid submission or your bid will not be accepted.

3. BID AND CONTRACT DOCUMENTS

The Bid and Contract Documents are available at the location stated in the Notice to Contractors Calling for Bids in three formats: online, hard copy, or CD/USB drive. The Bid and Contract Documents may be downloaded free of charge at the District's online Planroom at sandiegousdplans.com (click on Public Jobs to view all current bids). Contractors may purchase printed documents at Crisp Imaging for a refundable deposit of Two Hundred Dollars (\$200) per set or USB drives for a non-refundable payment (\$2 - \$10). Deposits shall be made by check payable to San Diego Unified School District. If Bid and Contract Documents, including addenda, are returned intact and in good order to Crisp Imaging within ten (10) days of the issuance of the Final Bid Tabulation, the check will be returned.

4. OFFICIAL ADVERTISING AND DISTRIBUTION SITES

The official media sources for advertising San Diego Unified School District bids are PlanetBids.com and The Daily Transcript. The official distribution point for bid documents is Crisp Imaging, 9240 Trade Place, Suite 300, San Diego, CA 92126, 858-535-0607. If bidders receive bid information or documents from any other source than those listed above, or from District departments other than Facilities Planning and Construction, the District will not be responsible for any erroneous information published or distributed.

5. DOCUMENTS ACCOMPANYING BID PROPOSAL

Each Bid Proposal shall be accompanied by: (a) the required Bid Security; (b) Subcontractors List; (c) Non-Collusion Declaration; and (d) DVB Bidder Declaration. All information or responses of a Bidder in its Bid Proposal and other documents accompanying the Bid Proposal shall be typewritten or in ink, complete, accurate and true; incomplete, inaccurate or untrue responses or information provided therein by a Bidder may be grounds for the District to reject such Bidder's Bid Proposal for non-responsiveness.

6. DESIGNATION OF SUBCONTRACTORS

In compliance with the Subletting and Subcontracting Fair Practices Act (California Public Contract Code §§4100, et seq.) and amendments thereof, each Bidder shall at time of bid set forth in the Subcontractors List: (a) the name and location of the place of business of each Subcontractor (as defined in Public Contract Code §4113, California Business & Professions Code §7026, and properly licensed with the California Contractors State License Board) who will perform work or labor or render services to the Bidder in or about the construction of the Work to be performed under the Contract Documents in an amount in excess of one-half of one percent (0.5%) of the Bidder's Bid Proposal; and (b) the portion of the Work which will be performed by each listed Subcontractor, and (c) the California contractor's license number and, (d) DIR Registration Number. The Bidder shall list only one Subcontractor for each portion of the Work as is defined by the Bidder.

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

Bidders may submit a listed subcontractor's full address and the percentage of work the subcontractor will perform within 24 hours of the bid opening date and time as permitted under Public Contract Code §4104(a)(3)(A).

Subcontractors must be actively and properly licensed by the CSLB for all scopes of work performed by the contractor at all times they are performing work on the District's project.

7. DIR REGISTRATION REQUIREMENTS

No contractor or subcontractor may submit a bid, be listed on a bid proposal, or awarded a contract for a public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code §1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code §1771.1(a)].

This project is subject to compliance monitoring and enforcement by the DIR. Prime contractors must include the DIR Registration Number for each of their listed subcontractors to the Subcontractors List AND submit a certificate of registration for their own firm and those of their listed subcontractors upon request by the District.

Failure of the bidding prime contractor to list their subcontractors DIR Registration Number on the Subcontractors List **at time of bid** may result in rejection of their bid as non-responsive.

8. PREVAILING WAGE RATES

Pursuant to Labor Code §1773 *et seq.*, the Director of the Department of Industrial Relations (DIR) of the State of California has determined the generally prevailing rates of wages in the locality in which the Work is to be performed. The Contractor awarded the Contract for the Work shall post a copy of all applicable prevailing wage rates for the Work at conspicuous locations at the Site of the Work. The Contractor and all Subcontractors performing any portion of the Work shall pay not less than the applicable prevailing wage rate for the classification of labor provided by their respective workers in prosecution and execution of the Work.

Prevailing wage requirements apply to this project and must be followed as stated in Article 17 of the General Conditions of this contract. The applicable wage determination for this contract is 2025-1 and will be 2025-1 for the duration of the contract. This includes amendments, change orders, and warranty work relating to this contract number. The following is a link to the Department of Industrial Relations website to obtain rate information, and any applicable predetermine increases dir.ca.gov/oprl/dprevwagedetermination.htm.

Furthermore, the Contractor and all subcontractors regardless of tier shall have an active DIR number prior to award and construction, and for the duration of site work. Any subsequent subcontractors/vendors who perform work at the construction site must also have an active DIR registration number. Pursuant to Labor Code § 1773.3(d) an awarding body shall withhold final payment due to the contractor until at least 30 days after all of the required information in paragraph (2) of subdivision (a) has been submitted to DIR, including, but not limited to, providing a complete list of all subcontractors regardless of tier. See Exhibit "D" of General Conditions.

9. CONTRACTORS LICENSE CLASSIFICATION

In accordance with the provisions of California Public Contract Code §3300, the District requires that Bidders possess the following classification(s) of California State Contractors License at the time that the Contract for the Work is awarded: **B**, or other appropriate license, subject to District approval. Any Bidder not so duly and properly licensed shall be subject to all penalties imposed by law. No payment shall be made for work, labor, materials or services provided under the Contract for the Work unless and until the Registrar of Contractors verifies to the District that the Bidder awarded the Contract is properly and actively licensed to perform the Work.

Under Business and Professions Code §7028.15(g), a bid submitted to the District by a contractor who is not licensed in accordance with this chapter [Business & Professions Code, Division 3. Professions and Vocations Generally, Chapter 9 Contractors] shall be considered nonresponsive and shall be rejected by the District, unless one of the exceptions under § 7028.15 apply. Under Business & Professions Code §7028.15(g), the District shall, before awarding a contract or issuing a purchase order, verify that the contractor was properly licensed when the contractor submitted the bid, unless one of the exceptions under § 7028.15 apply.

Under Business & Professions Code §7028.15(a), it is a misdemeanor for any person to submit a bid to a public agency in order to engage in the business or act in the capacity of a contractor within this state without having a license.

10. MANDATORY PREQUALIFICATION FOR PROJECTS ESTIMATED AT \$1,000,000 OR OVER

Pursuant to Public Contract Code (PCC) §20111.6, each contractor submitting a bid as a prime to the District for projects estimated at \$1,000,000 or over, or any subcontractor performing the license classifications of A, B [if performing the work of] C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43 and C-46 wishing to submit a bid to a bidding prime contractor must be prequalified in order to bid.

A contractor who submits a bid who is not prequalified at time of bid, or who lists a non-prequalified subcontractor performing any of the classifications listed in the paragraph above to perform a portion of work will be rejected as non-responsive. PCC §20111.6(f) states the District may not accept a bid proposal from any person or entity that is required to submit a completed questionnaire and financial statement, or any other person or other entity that uses a subcontractor that is required to submit a completed questionnaire and financial statement for prequalification.

Any prime contractor or subcontractor who is not already prequalified must submit the online Prequalification Application **at least** ten (10) business days prior to the bid opening due date. Any Application received less than ten (10) business days before the bid opening due date will not be considered. Any Application submitted incomplete will be put aside to process completed Applications first and may result in an incomplete Application not being processed within the required timeline of five (5) business days prior to the bid opening due date. Such action will render the prime contractor or subcontractor who submitted the incomplete Application to be ineligible to bid on the project for which they submitted the Application.

The District strongly encourages all prime contractors and subcontractors performing any of the classifications listed above to submit a Prequalification Application well in advance of a bid in order to avoid the consequence of not being eligible to bid on a project they are interested in bidding on. Contractors must be a registered SDUSD PlanetBids vendor to complete the prequalification process. Go to tinyurl.com/SDUSD-PlanetBids and login as a vendor, then click the menu on the left, and select prequalification to get started.

11. CONTRACT TIME

Performance and completion of the Work shall be in accordance with the Supplementary Conditions and Specifications Section 01 10 00. Failure to achieve completion of the Work within the Milestone Dates established therein will subject the Contractor to assessment of Liquidated Damages for delayed Substantial Completion, as set forth in the Contract Documents.

12. BID SECURITY

Each Bid Proposal shall be accompanied by Bid Security in an amount not less than **Ten Percent (10%)** of the maximum amount of the Bid Proposal, inclusive of any Additive or Deductive Alternate bid item(s). District will accept a copy of the Bid Security at time of electronic-only bid, and will require the original Bid Security to be delivered to Facilities Planning and Construction at 2351 Cardinal Lane, Building M, San Diego, CA 92123 within 24 hours of the bid opening. Failure of any Bid Proposal to be accompanied by Bid Security in the form and in the amount required shall render such Bid Proposal to be non-responsive and rejected by the District.

13. WITHDRAWAL OF BID PROPOSALS

Bid Proposals may not be withdrawn by any Bidder for a period of **Ninety (90)** days after the opening of Bid Proposals. During this time, all Bidders shall guarantee prices quoted in their respected Bid Proposals. A successful bidder shall not be relieved of the bid submitted without the District's consent or bidder's recourse to Public Contract Code §5100 et seq.

14. SUBSTITUTE SECURITY

In accordance with the provisions of California Public Contract Code §22300, substitution of eligible and equivalent securities for any monies withheld by the District to ensure the Contractor's performance under the Contract will be permitted at the request and expense of the Contractor and in conformity with California Public Contract Code §22300.

15. REJECTION OF BIDS AND WAIVER OF IRREGULARITIES

The District reserves the right to reject any or all Bid Proposals, to contract work with whomever and in whatever manner the District decides, to abandon the Work entirely, and to waive any informality or non-substantive irregularity in any Bid Proposal or in the bidding as the interests of the District may require.

16. AWARD OF CONTRACT

Acceptance of a Bid Proposal occurs upon Award of Contract. The Contract for the Work, if awarded, will be by action of the District's Board of Education to the responsible Bidder submitting the lowest responsive Bid Proposal. If Additive or Deductive Bid Items are included in the bidding process, the lowest Bid Proposal will be determined on the basis of the Base Bid Proposal or on the Base Bid Proposal, additional Items and any combination of Additive or Deductive Bid Items selected in accordance with the applicable provisions of the Instructions to Bidders and the Bid Proposal Form.

17. DEFINITION OF AGREEMENT, CONTRACT

Agreement: The Agreement is the executable document (E-xx) that binds District and Contractor to the terms and conditions of the Contract documents.

Contract: The Contract is the entire set of binding documents comprised of the Executable documents, General Conditions, Supplementary Conditions, Specifications, Drawings and all issued Addenda.

18. MANDATORY SITE VISIT

Pursuant to San Diego Unified School District requirements, it is mandatory that all Bidders attend the scheduled Site Visit listed in the Notice to Contractors Calling for Bids. This is a material requirement of the Construction Contract, and should a prospective bidder not attend the Site Visit, such Bidder's bid will be rejected as non-responsive. For multiple site projects, Bidders must attend all sites scheduled for a visit.

To be eligible to attend a mandatory site walk, a Contractor attendee must preregister with the District at sandiegounified.org/sitewalks. Registration for the mandatory site walk will be the official sign-in sheet at the site walk.

19. RECEIPT AND OPENING OF BID PROPOSALS

- 19.1 Bid Proposal Forms. Bid Proposals shall be submitted on the forms obtained at Crisp Imaging, as mentioned in the Notice to Contractors Calling for Bids. Bid Proposals submitted on forms other than those obtained pursuant to the preceding will be rejected as non-responsive. All information required by the bid forms must be completely and accurately provided, typewritten or in ink. Responses to required information which are incomplete, inaccurate, untrue or which contain omissions of material fact rendering the response false or misleading may result in rejection of a Bid Proposal for non-responsiveness. The Bid Proposal and other documents required to be executed on behalf of the Bidder and submitted with the Bid Proposal must be executed in the name of the Bidder and must bear the original signature(s) in longhand of the person(s) duly authorized to execute the Bid Proposal and other documents on behalf of the Bidder.
- 19.2 Submission of Bid Proposal. A Bid Proposal and other documents accompanying the Bid Proposal shall be submitted through PlanetBids tinyurl.com/SDUSD-PlanetBids prior to the date and time set forth above for the electronic bid opening. Only Bid Proposals submitted and received prior to the latest date and time for submission of Bid Proposals will be considered. Bidders are solely responsible for the timely submission of Bid Proposals.
- 19.3 Electronic-Only Bidding. After the latest date/time for submission of Bid Proposals, the preliminary bid results will be made available through PlanetBids.
- 19.4 Pricing: The District's computation of offered prices will always be based on the Bidder's unit price multiplied by the quantity for a particular item. In the event that there are unit prices as well as extended prices, the unit price will prevail in the event of a mathematical discrepancy.
- 19.5 Equal Bids: In accordance with Public Contract Code §20117, in the event that equal Bids are received, the successful Bidder shall be randomly selected through a drawing.
- 19.6 Erasures. Erasures, interlineations or other corrections to the Bid Proposal or other documents submitted with a Bid Proposal may render the Bid Proposal non-responsive unless the same are suitably authenticated by affixing in the margin immediately next to any erasure, interlineation or other correction the initials of a person(s) authorized to act on behalf of the Bidder.
- 19.7 Modifications. Upon submission of a Bid Proposal through PlanetBids, Bidder's may modify any portion of the Bid Proposal or other documents submitted with the Bid Proposal until the scheduled date and time of the bid opening has been met. If the latest revised submission of a Bid Proposal is not received in PlanetBids by the closing date and time, the last submission of the Bid Proposal will be received and considered.
- 19.8 Multiple Sites. Please note that if this project is for more than one school site you may be required to break your bid down by site. Please see Bid Proposal form to determine these requirements prior to doing your takeoffs.

20. EXAMINATION OF CONTRACT DOCUMENTS

Each Bidder shall become fully acquainted with conditions relating to the Work to fully understand the facilities, difficulties, and restrictions attending the execution of the Work. Bidders shall

thoroughly examine and be familiar with the Drawings and Specifications and all other Contract Documents. The failure of any Bidder to receive or examine any of the Contract Documents, form, instrument, addendum, or other document or to visit the Sites and be acquainted with the conditions there existing shall in no way relieve any Bidder from obligations with respect to its Bid Proposal or to the contract. The submission of a Bid Proposal shall be taken as prima facie evidence of compliance with this section.

21. EXECUTION OF AGREEMENT

The apparent low bidder must sign the Agreement included in this Invitation for Bids and must submit it within three (3) business days of written notification by District.

22. DELIVERY OF BONDS AND CERTIFICATES

Unless otherwise specified, the successful bidder shall, within five (5) business days after written notification by the District, sign and deliver to the District the Labor and Material Payment Bond and Performance Bond, certificates of insurance, and other required documents. In the event the successful bidder fails or refuses to so deliver such documents by the deadline date, the District may declare the bidder's bid deposit or bond forfeited as damages, and may award the work to the next lowest responsible bidder, or may reject all bids and call for new bids.

The penal sums of the Labor and Materials Payment Bond and the Performance Bond shall each be in an amount equal to 100% of the Contract Price, unless otherwise stated in the Supplementary Conditions. Bonds required by the Contract Documents shall be accepted by the District only if issued and duly executed by a responsible corporate surety, authorized to issue such bonds in the State of California and secured through an authorized agent with an office in California.

23. INTERPRETATION OF CONTRACT DOCUMENTS.

If any person contemplating submission of a Bid Proposal for the proposed Contract is in doubt as to the true meaning of any part of the Drawings, Specifications, or other portions of the Contract Documents, or finds discrepancies in, or omissions from the Drawings, Specifications or other portions of the Contract Documents, a written request for an interpretation or correction thereof shall be submitted to the address as mentioned in the Notice To Contractors Calling For Bids. Any Bidder submitting such a request is solely responsible for its prompt delivery. Any interpretation or correction, or other modification of any portion of the Contract documents will be made only by Addendum duly issued by or on behalf of the District and a copy of such Addendum will be posted on the District online Planroom, and made available to each Bidder who has theretofore obtained a set of the Contract Documents from Crisp Imaging. The District will not be responsible for any other explanations or interpretations of the Contract Documents. No oral interpretation, correction or modification of any portion of the Contract Documents will be made to any bidder and no Bidder may rely upon any such oral interpretation, correction or modification. Addenda issued pursuant to the above shall be made a part of the Contract Documents. All interpretations, corrections or modifications made by Facilities Planning and Construction, San Diego Unified School District, shall be final and binding. Failure of a Bidder to request interpretation, correction or modification of known discrepancies in, or omissions in the Drawings, Specifications or other portions of the Contract Documents shall be deemed an acknowledgment by the Bidder that if awarded the Contract for the Work, the Bidder will remedy said discrepancies and omissions at no additional cost to the Owner.

24. ADDENDA AND AMENDMENTS

The terms and conditions contained in the Notice to Contractors Calling for Bids, Bid Proposal Form, Instructions to Bidders, General Conditions, Supplementary Conditions, Specifications, Agreement, and any other document that comprises this Invitation for Bids herein may be amended or modified only with the proper written approval of the District.

Addenda will be issued directly from the District online Planroom, via PlanetBids, and through Crisp Imaging via hard copy. Bidder is completely responsible for obtaining and verifying all addenda issued for bids advertised by the District. Failure of a bidder to obtain and acknowledge in the Bid Proposal all addenda may result in their bid being rejected as non-responsive.

Any addenda issued during the time of bidding shall form a part of this Invitation for Bids and shall constitute a part of the contract documents.

25. AWARD OF CONTRACT

- 25.1 Action by Board of Education. The acceptance of a Bid Proposal occurs upon Award of Contract. The contract, if awarded, will be by action of its Board of Education to the responsible, responsive Bidder submitting the lowest priced Bid Proposal on the basis of the Base Bid Proposal or the Base Bid Proposal and Additive or Deductive Bid Items, if any, selected in accordance with this Instructions to Bidders.
- 25.2 Selection of Additive or Deductive Bid Items. If Additive or Deductive Bid Items are part of determining the responsive low bidder, as stated in the Bid Proposal Form, the selection of Additive or Deductive Bid Items for inclusion in the scope of the Work of the Contract to be awarded and for determination of the lowest Bid Proposal based upon the Base Bid Proposal and the combination of Additive or Deductive Bid Items selected for inclusion in the Contract to be awarded will be by a "blind-bidder" process. See Public Contract Code §20103.8(d). After the public reading of Bid Proposals, District clerical staff ("Clerical Staff") who will not be engaged in the selection of Additive or Deductive Bid Items for inclusion in the Contract to be awarded will assign each Bidder an alphabetical letter for identification purposes. The Clerical Staff will mask all portions of the Bid Proposal and other documents submitted with Bid Proposals so that the identity of each Bidder is not revealed. The Clerical Staff will maintain a list ("the Bidders List"), which identifies by name and the alphabetical letter assigned by the Clerical Staff to each Bidder. After the public reading of Bid Proposals, the Clerical Staff will provide the District's staff responsible for selection of Additive or Deductive Bid Items for inclusion in the Contract to be awarded ("District Project Staff") copies of Bid Proposals with the identities of Bidders masked; Bid Proposals reviewed by the District Project Staff will identify Bidders only by alphabetical letters. At such time as the District Project Staff has completed review of Bid Proposals and made a determination of which Bidder (by the alphabetical letter assigned by Clerical Staff) has submitted the lowest Bid Proposal on the basis of the Base Bid Proposal and any combination of Additive or Deductive Bid Items as determined by the District Project Staff, the Clerical Staff will make available to the Project Staff the Bidders List so that the identity of the Bidder to be awarded the Contract can be identified. Until such time as the District Project Staff has completed review of Bid Proposals and determined which Bidder has submitted the lowest Bid Proposal, there will be no communication between the Clerical Staff and the District Project Staff regarding the identities of Bidders or disclosure of any portion of the Bidders List.
- 25.3 Additive or Deductive Bid Items Not Included in Award of Contract. Bidders are referred to the provisions of the Contract Documents permitting the District, during performance of the Work, to add or delete from the scope of the Work Additive or Deductive Bid Items with the cost or credit of the same being the amount(s) set forth by in the Additive or Deductive Bid Items Proposal. See Public Contract Code §20103.8.
- 25.4 Responsive Bid Proposal. A responsive Bid Proposal shall mean a Bid Proposal, which conforms, in all material respects, to the requirements of Bid and Contract Documents.
- 25.5 Responsible Bidder. Under Public Contract Code §1103, a responsible Bidder is a Bidder who has the capability in all respects, to perform fully the requirements of the Contract Documents and the quality, fitness, capacity and experience which will assure good faith performance. In determining responsibility, the following criteria will be considered: (i) the ability, capacity and skill of the Bidder to perform the Work of the Contract Documents; (ii) whether the Bidder can perform the Work promptly and within the time specified, without

delay or interference; (iii) the character, integrity, reputation, judgment, experience and efficiency of the Bidder; (iv) the quality of performance of the Bidder on previous contracts, by way of example only, the following information will be considered: (a) the administrative, consultant or other cost overruns incurred by the District on previous contracts with the Bidder; (b) the Bidder's compliance record with contract general conditions on other projects; (c) the submittal by the Bidder of excessive and/or unsubstantiated extra cost proposals and claims on other projects; (d) the Bidder's record for completion of work within the contract time and the Bidder's compliance with the scheduling and coordination requirements on other projects; (e) the Bidder's demonstrated cooperation with the District and other contractors on previous contracts; (f) whether the work performed and materials furnished on previous contracts was in accordance with the Contract Documents; (v) the previous and existing compliance by the Bidder with laws and ordinances relating to contracts; (vi) the sufficiency of the financial resources and ability of the Bidder to perform the work of the Contract Documents; (vii) the quality, availability and adaptability of the goods or services to the particular use required; (viii) the ability of the Bidder to provide future maintenance and service for the warranty period of the Contract; (ix) whether the Bidder is in arrears on debt or contract or is a defaulter on any surety bond; (x) such other information as may be secured by the District having a bearing on the decision to award the Contract, to include without limitation the ability, experience and commitment of the Bidder to properly and reasonably plan, schedule, coordinate and execute the Work of the Contract Documents and whether the Bidder has ever been debarred from bidding or found ineligible for bidding on any other projects. The ability of a Bidder to provide the required bonds will not of itself demonstrate responsibility of the Bidder.

26. BIDDERS INTERESTED IN MORE THAN ONE BID; NON-COLLUSION DECLARATION

No person, firm or corporation shall be allowed to make, or file, or be interested in more than one bid for the same work unless alternate bids are specifically called for. A person, firm, or corporation that has submitted a sub-proposal to a bidder, or who has quoted prices of materials to a bidder is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders, or from submitting a Bid Proposal itself to the District. The form of Non-Collusion Declaration included in the Contract Documents must be completed and duly executed on behalf of the Bidder; failure of a Bidder to submit a completed and executed Non-Collusion Declaration with its Bid Proposal may render the Bid Proposal non-responsive.

27. SUBSTITUTION OF SPECIFIED ITEMS

Pursuant to Public Contract Code §3400, whenever the Contract Documents refer to any specific article, device, equipment, product, material, fixture, specified patent or proprietary name, patented process, form, method or type of construction, by name, make, trade name, or catalog number ("specified item"), such reference shall be deemed to be followed by the words, "or equal", unless it is indicated that no substitutions will be considered. Any Bidder who has timely submitted a Bid Proposal may submit data to the District to substantiate a request to substitute a specified item ("Substitution Substantiation Data") using the form provided in the contract documents. However, a request to substitute a specified item will not be considered for approval until after the District's Board of Trustees has taken action to award the Contract without any conditions or reservations. Therefore, bidders should not consider, use or include proposed substitutes for specified items when submitting their bid. Substitution Substantiation Data submitted by any Bidder with its Bid Proposal will not be considered by the District nor be deemed a submission of Substitution Substantiation Data. The Bidder awarded the Contract may request the substitution of specified items in the Contract Documents upon strict compliance with the applicable terms of the Contract Documents.

28. DISABLED VETERAN BUSINESS (DVB) PARTICIPATION PROGRAM

Disabled Veteran Business (DVB) includes certified federal Small Business Administration Service-Disabled Veteran Owned Small Businesses (SDVOSBs) and certified California Department of General Services Disabled Veteran Business Enterprises (DVBs). Pursuant to a board-approved resolution in support of Disabled Veteran Businesses (DVBs), the San Diego Unified School District has replaced the good faith effort with a **mandatory requirement** of 3% for DVB participation on **all** District construction bids, regardless of size. The failure of any Bidder to comply with the District's DVB Participation Program Policy **will** result in rejection of a Bidder's Bid Proposal for non-responsiveness.

At time of bid, bidders **must complete all information except for the shaded areas** on the DVB Bidder Declaration form or may be deemed non-responsive. Bidders will be required to submit a **complete** DVB Bidder Declaration, including the subcontractor/supplier's full address, contact information, bidder name or subcontractor who will be hiring the DVB subcontractor/supplier, work to be performed or supplies to be provided, and subcontractor/supplier DVB percentage within 24 hours of the bid opening date and time.

DVBs need to have a current and valid DVBE certification from the State of California Department of General Services or a current and valid SDVOSB certification from the U.S. Small Business Administration; self-representation will not be accepted. Eligibility must be current at time of bid and contract award. If requested by the District, Bidders will need to submit certification(s) within twenty-four (24) hours of the request.

29. PUBLIC RECORDS

Bid Proposals and other documents responding to the Call for Bids become the exclusive property of the District upon submittal to the District. At such time as the District issues the Bid Tabulation pursuant to these Instructions to Bidders, all Bid Proposals and other documents submitted in response to the Call for Bids become a matter of public record and shall thereupon be considered public records. A Bidder that indiscriminately marks all or most of its Bid Proposal as exempt from disclosure as a public record, whether by the notations of "Trade Secret," "Confidential," "Proprietary," or otherwise, may render the Bid Proposal non-responsive and rejected. The District is not liable or responsible for the disclosure of such records, including those exempt from disclosure if disclosure is deemed required by law, by an order of Court, or which occurs through inadvertence, mistake or negligence on the part of the District or its officers, employees or agents. At such time as Bid Proposals are deemed a matter of public record, pursuant to the above, any Bidder or other party shall be afforded access for inspection and/or copying of such Bid Proposals, by request made to the District in conformity with the California Access to Public Records Act, California Government Code §§6250, et. seq. If the District is required to defend or otherwise respond to any action or proceeding wherein request is made for the disclosure of the contents of any portion of a Bid Proposal deemed exempt from disclosure hereunder, the Bidder submitting the materials sought by such action or proceeding agrees to defend, indemnify and hold harmless the District in any action or proceeding from and against any liability, including without limitation attorneys' fees arising therefrom. The party submitting materials sought by any other party shall be solely responsible for the cost and defense in any action or proceeding seeking to compel disclosure of such materials; the District's sole involvement in any such action shall be that of a stakeholder, retaining the requested materials until otherwise ordered by a court of competent jurisdiction.

30. DRUG FREE WORKPLACE CERTIFICATE

In accordance with California Government Code §§8350 et seq., the Drug Free Workplace Act of 1990, the successful Bidder will be required to execute a Drug Free Workplace Certificate concurrently with execution of the Bid Proposal. The successful Bidder will be required to implement and take the affirmative measures outlined in the Drug Free Workplace Certificate and

in California Government Code §§8350 et seq. Failure of the successful Bidder to comply with the measures outlined in the Drug Free Workplace Certificate and in California Government Code §§8350 et seq. may result in penalties, including without limitation, the termination of the Agreement, the suspension of any payment of the Contract Price otherwise due under the Contract Documents and/or debarment of the successful Bidder.

31. COMPLIANCE WITH IMMIGRATION REFORM AND CONTROL ACT OF 1986

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

32. DEBARMENT

Federal Executive Order (E.O.) 12549 "Debarment" requires that all contractors receiving individual awards, using federal funds, and all subcontractors certify that the organization and its principals are not debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency from doing business with the Federal Government. As part of bid responsiveness, District will verify the successful bidders' and his listed subcontractors' status prior to award of contract. Any successful bidder found on the Federal debarment list will be rejected as non-responsive. Information on debarment is available at the following website: www.sam.gov.

33. ALTERNATE BID PROPOSALS; ALTERNATE BID ITEM(S)

If the Bid Proposal forms do not specifically call for the submittal of alternate bid(s) or bid(s) for alternate item(s) and a Bidder submits alternate bid(s) or bid(s) for alternate bid item(s), the District may deem the Bid Proposal to be non-responsive and reject the same. In the event that alternate item(s) are specifically called for in the Bid Proposal forms, any Bid Proposal which does not include bid(s) for the alternate item(s) may result in the Bid Proposal being deemed by the District to be non-responsive and rejected. In the event that bids for alternate item(s) are specifically called for in the Bid Proposal forms, the Bidder is referenced to the provisions of the Contract Documents permitting the District, during performance of the Work of the Contract Documents, to add or delete such alternate item(s) with the cost or credit (inclusive of all direct and indirect costs, supervision, overhead and profit) for such alternate item(s) shall being in the amount(s) set forth in the Bidder's Bid Proposal for such alternate items(s).

34. RECOMMENDATION TO AWARD CONTRACT

The District will issue a Final Bid Tabulation, identifying the Bidder to whom the District recommends award of the Contract and the date/time/place of the District's Board of Education meeting at which time award of the Contract will be considered.

35. BID PROTEST

A bidder must have standing (i.e., sufficient protectable and tangible interest at stake) to submit a bid protest. For example, whereas a second low bidder may file a bid protest as to the first low bidder, a third low bidder may only file a bid protest if it has basis to challenge the second and first low bidders. A bidder whose bid has been rejected as non-responsive by the District has no standing to protest another's bid, but may protest the rejection of their own bid only. Any Bidder, with the exception of a declared non-responsive bidder, submitting a Bid Proposal to the District's address as mentioned in the Notice to Contractors Calling for Bids may file a protest of the District's recommendation to award the Contract provided that each and all of the following are complied with:

- 35.1 The bid protest is in writing on company letterhead and sent via email, fax, US Mail or hand delivered. The bid protest is filed and received by the Contracts Administration Supervisor, at the address as mentioned in the Notice To Contractors Calling For Bids, not more than five (5) calendar days following the date of issuance of the District's Final Bid Tabulation; and the written bid protest sets forth, in detail, all grounds for the bid protest, including without limitation all facts, supporting documentation, legal authorities and argument in support of the grounds for the bid protest; any matters not set forth in the written bid protest shall be deemed waived. All factual contentions must be supported by competent, admissible and creditable evidence.
- 35.2 Any bid protest not conforming to the foregoing shall be rejected by the District as invalid. Provided that a bid protest is filed in strict conformity with the foregoing, the Contracts Administration Supervisor, or such individual(s) as may be designated by him/her, shall review and evaluate the basis of the bid protest. Either the Contracts Administration Supervisor or other individual designated by him/her shall provide the bidder submitting the bid protest with a written statement concurring with or denying the bid protest.
- 35.3. Upon receipt of the written statement from the Contracts Administration Supervisor, if the bidder submitting the bid protest would like a further opportunity to be heard, the bidder shall submit in writing (e-mail is not acceptable) a request for a panel review. This request must be received by the Contracts Administration Supervisor, at the address as mentioned in the Notice To Contractors Calling For Bids, not more than five (5) calendar days following the date of the written statement in the preceding paragraph. Either the Contracts Administration Supervisor or other individual designated by him/her will convene a panel to consider oral and written evidence from the bidder submitting the bid protest as well as the apparent low bidder(s). The panel will consider evidence presented at the proceeding as well as previously submitted evidence. Failure to attend or present evidence shall constitute a waiver of that opportunity to be heard. Either the Contracts Administration Supervisor or other individual designated by him/her shall provide the bidder submitting the bid protest with a written statement concurring with or denying the bid protest, which will be the recommendation to the District's Board of Education.
- 35.4 The District's Board of Education will render a final determination and disposition of a bid protest by taking action to adopt, modify or reject the disposition of the contract award as reflected in the written statement of the Director, Purchasing and Contracts, or his/her designee. Action by the District's Board of Education relative to a bid award shall be final and not subject to appeal or reconsideration by the District, any employee or officer of the District or the District's Board of Education. The rendition of a written statement by the Director, Purchasing and Contracts (or his/her designee) and action by the District's Board of Education to adopt, modify or reject the disposition of the bid award reflected in such written statement shall be express conditions precedent to the institution of any legal or equitable proceedings relative to the bidding process, the District's intent to award the Contract, the District's disposition of any bid protest or the District's decision to reject all Bid Proposals.

36. QUESTIONS PERTAINING TO THIS BID

Questions pertaining to this bid should be addressed to:

Jess Imperial, Senior Contracts Specialist, Construction
San Diego Unified School District
Facilities Planning and Construction
2351 Cardinal Lane, Bldg. M
San Diego, CA 92123
jimperial@sandi.net

PRE-BID SUBMITTAL DOCUMENT CHECKLIST

This checklist is to assist the bidder in submitting a complete and responsive bid offer. The inclusion of all the required documents at time of bid does not in itself render the bidder's offer as responsive.

- ☐ **I am prequalified to bid as prime contractor by San Diego Unified School District.**
- ☐ Completed and signed Bid Proposal Form.
- ☐ Listed all subcontractors performing more than ½ of 1% of the total bid value on the Subcontractors List and provided the minimum required information at time of bid per Article 6 in the Instructions to Bidders.
- ☐ Listed DIR Registration Number for each listed subcontractor.
- ☐ Completed and signed Non-collusion Declaration.
- ☐ Completed and signed Bid Security Bond with Attorney-in-Fact certificate attached or provided a cashier's check for 10% of your bid's value.
- ☐ Completed and signed DVB Bidder Declaration. **NOTE: In addition to certifying that your company will meet or exceed 3% DVB participation requirement, this document must contain at a minimum the DVB subcontractor/supplier name, contact information, and certification number for your bid to be considered responsive to the District's DVB requirements (see Article 28 in the Instructions to Bidders).** Any deviation from what is instructed in the bid terms and conditions may render your bid non-responsive. If you are uncertain about this requirement please e-mail Sharon Cheng, Contracts Administration Supervisor, Construction at scheng@sandi.net for assistance.

BID PROPOSAL

TO: **SAN DIEGO UNIFIED SCHOOL DISTRICT** ("District"), a California Public School District, acting by and through its Board of Education.

FROM:

Name of Bidder: _____

Address: _____

City, State, Zip Code: _____

Phone Number: _____

Email Address: _____

Name of Bidder's Authorized Representative: _____

Legal Status (i.e., corporation, sole proprietorship, partnership, LLP): _____

Contractor License Number(s): _____

License Classification(s): _____

License Expiration date(s): _____

DIR Registration Number: _____

Bid Proposal Amount. Pursuant to and in compliance with the Notice to Contractors Calling for Bids, the Instructions to Bidders, and the other documents relating thereto, the undersigned Bidder, having reviewed the Instructions to Bidders, General Conditions, Supplementary Conditions, Specifications, Agreement, and all other Contract Documents and upon compliance with all requirements therein with reference to the submittal of this Bid Proposal, hereby proposes and agrees to perform the Contract including, without limitation, all of its component parts; to perform everything required to be performed, to provide and furnish any and all of the labor, materials, tools, equipment, and services necessary, including all taxes, and to perform and complete the Contract in a workmanlike manner all of the Work required for the Project described as:

NO. CP25-1029-52-00-00 – FURNISH AND INSTALL WALK-IN FREEZERS AT BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL

in accordance with the Contract Documents as set forth as follows:

METHOD OF DETERMINING LOW BIDDER: The low bidder will be determined by the sum total of Base Bid Items 1-2.

Bidders will be prompted to acknowledge addenda and enter the base bid price(s) when submitting electronic Bids and accompanying documents through PlanetBids.

Refer to Specification Section 01 21 00 Allowances

ALLOWANCES WILL BE ADDED BY THE DISTRICT TO THE BASE BIDS.

Additive or Deductive Bid Items: If Bid Proposal prices are required for Additive or Deductive Bid Items, the Bidder's price proposal(s) for Additive or Deductive Bid Items shall be entered in PlanetBids. The Bidder acknowledges that the District may, at its sole discretion, elect to include as part of the Scope of Work of the Contract any Additive or Deductive Bid Item selected in accordance with the Instructions to Bidders, and in such event, the cost or credit to the District shall be as set forth in the Additive or Deductive Bid Item Proposal submitted through PlanetBids. Failure to include Bid Proposal prices, even if "zero," for any Additive or Deductive Bid Item included in the bidding process, will render the Bid Proposal non-responsive and rejected.

Unit Price Items: If unit pricing is required, it shall be entered on the Unit Price Sheet and submitted at time of bid on PlanetBids. Failure to include pricing, even if "zero," for Unit Price Item(s) included in the bidding process, may render the Bid Proposal non-responsive and rejected.

Rejection of Bid; Holding Open of Bid: It is understood that the District reserves the right to reject this Bid Proposal and that this Bid Proposal shall remain open and not be withdrawn for the period of time specified in the Instructions to Bidders.

Documents Accompanying Bid: The undersigned Bidder shall submit with this Bid Proposal the following:

- Unit Price Sheet, *if required*
- Subcontractors List
- Non-Collusion Declaration
- Bid Security Bond
- DVB Bidder Declaration

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

It is understood and agreed that if written notice of the acceptance of this Bid Proposal demonstrated by Bid Tabulation thereon is e-mailed or delivered by the District to the undersigned after the opening of Bid Proposals, the undersigned will execute and deliver to the District all required documents in accordance with the Bid Proposal as detailed in the Required Executable Documents and Timeline ("Timeline") and the Instructions to Bidders. Pursuant to the Timeline, all bidders of the Contract shall deliver to the District within twenty-four (24) hours after bid opening the following documents: (a) Completed Subcontractors List and (b) completed DVB Bidder Declaration.

Requirements of Low Bidder Recommended for Award of Contract: Pursuant to the Timeline, the apparent low bidder of the contract shall deliver to the District the following documents: (a) Electronic Signature Acknowledgement & Agreement; (b) Agreement; (c) Certificates of Workers' Compensation Insurance; (d) Drug-Free Work Place Certification; (e) Guarantee; (f) Contractor Certification Regarding Background Checks; (g) Attachment A List of Employees; (h) Roofing Certification Public Contract Code Section 3006 (if applicable); (i) Electrician Certification (if applicable); (j) Certificated of DIR registration (pursuant to SB 854); (k) the Labor and Material Payment Bond; (l) the Performance Bond; and (m) Original Insurance certificates(s) for General and Auto Liability and Workers Compensation. All of the foregoing shall be in conformity with applicable requirements set forth in Notice to Contractors Calling for Bids, the Instructions to Bidders, and in each of the foregoing Documents. Failure of the Bidder recommended the Contract to strictly comply with the preceding, may result in the District's rescission of its recommendation of the award of the Contract and/or forfeiture of the Bidder's Bid Security. In such event, the District may, in its sole and exclusive discretion, elect to award the Contract to the responsible Bidder submitting the next lowest Bid Proposal, or to reject all Bid Proposals. The Work under the Contract Documents shall be commenced by the undersigned Bidder, if awarded the Contract, on the date stated in the District's Notice to Proceed, issued pursuant to the Contract Documents. Substantial Completion of the Work shall be achieved within the Contract Time specified in the Contract Documents.

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

Contractor's License: The undersigned Bidder is currently and duly licensed in accordance with the California Contractors License Law, California Business & Professions Code §§7000 et seq. By executing this Bid Proposal and submitting the same to the District, the Bidder acknowledges the provisions of California Business & Professions Code §7028.15, which provides that it shall be a misdemeanor for any person to submit a bid proposal to a public agency without having a license to perform the work of the bid proposal. By executing this Bid Proposal, the Bidder hereby certifies that: (a) it is duly licensed, in the necessary class(es) for performing the Work of the Contract Documents; (b) that such license shall be in full force and effect throughout the duration of the performance of the Work under the Contract Documents; and (c) that all Subcontractors (as defined in Public Contract Code §4113 and Business & Professions Code §7026) providing or performing any portion of the Work of the Contract Documents shall be so similarly and appropriately licensed to perform or provide such portion of the Work.

Designation of Subcontractors: In compliance with the Subletting and Subcontracting Fair Practices Act (California Public Contract Code §§4100, et seq.) and amendments thereof, each Bidder shall set forth **at time of bid** in the Subcontractors List: (a) the name and location of the place of business of each Subcontractor who will perform work, or labor, or render services to the Bidder in or about the construction of the Work to be performed under the Contract Documents, in an amount in excess of one-half of one percent (0.5%) of the Bidder's Bid Proposal; (b) the Subcontractor's license number; (c) the portion of the Work which will be performed by each listed Subcontractor; and, (d) DIR Registration Number. The Bidder shall list only one Subcontractor for each portion of the Work as defined by the Bidder in its Bid Proposal. If a Bidder fails to list a Subcontractor or if the Bidder specifies more than one Subcontractor for the same portion of Work to be performed under the Contract Documents valued in excess of one-half of one percent (0.5%) of the Bidder's Bid Proposal amount, the Bidder shall be deemed to agree that it is fully qualified to perform that portion of the Work itself and that it shall perform that portion of the Work. Subcontractor is defined in Public Contract Code §4113 and Business & Professions Code §7026.

Confirmation of Figures: By submitting this Bid Proposal, the Bidder confirms that it has checked the Base Bid Item numbers, Allowances, Additive or Deductive Bid Item numbers (if applicable), and Unit Price Items (if applicable) entered into PlanetBids, and understands that neither the District nor any of its agents, employees, or representatives shall be responsible for any errors or omissions on the part of the undersigned Bidder in preparing and submitting this Bid Proposal.

Acknowledgment and Confirmation: The undersigned Bidder acknowledges its receipt, review, and understanding of the Drawings, the Specifications, and other Contract Documents pertaining to the proposed Work. The undersigned Bidder certifies that the Contract Documents are, in its opinion, adequate, feasible, and complete for providing, performing, and constructing the Work in a sound and suitable manner for the use specified and intended by the Contract Documents. The undersigned Bidder certifies that it has, or has available, all necessary equipment, personnel, materials, facilities, and technical and financial resources to complete the Work for the amount bid herein within the Contract Time and in accordance with these Contract Documents.

By: _____
(Signature of Company Officer) (Date)

(Typed or Printed Name) (Title)

SUBCONTRACTOR LIST

NOTE!

Public Contract Code requires the bidding prime contractor to list ALL subcontractors performing over 1/2 of 1% of the project's scope of work.

Effective July 1, 2014, no contractor or subcontractor may be listed on a bid proposal or awarded a contract for a public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code §1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code §1771.1(a)].

This project is subject to compliance monitoring and enforcement by the DIR. Prime contractors must add the DIR Registration Number for each of their listed subcontractors to the Subcontractors List AND submit a certificate of registration for their own firm and those of their listed subcontractors upon request by the District.

Failure of the bidding prime contractor to list their subcontractors' DIR Registration Number on the Subcontractors List ***at time of bid*** may result in rejection of their bid as non-responsive.

SUBCONTRACTORS LIST

Bidder: _____

Address: _____

Telephone: _____ Email: _____

Bidder(s) Authorized Representative(s): _____

PROJECT: FURNISH AND INSTALL WALK-IN FREEZERS AT BELL MIDDLE SCHOOL AND

If a subcontractor is performing more than one trade, please list all trades separately in case there is a need for a subcontractor substitution after awarding the contract.

TRADE/PORION OF THE WORK	SUBCONTRACTOR NAME AND LICENSE NUMBER	LICENSE CLASSIFICATION	SUBCONTRACTOR BUSINESS LOCATION	% OF CONTRACT VALUE	DIR REG. NO.

TRADE/PORTION OF THE WORK	SUBCONTRACTOR NAME AND LICENSE NUMBER	LICENSE CLASSIFICATION	SUBCONTRACTOR BUSINESS LOCATION	% OF CONTRACT VALUE	DIR REG. NO.

NOTE: Under Public Contract Code section 4100 et. seq. known as the Subletting and Subcontracting Fair Practices Act, all subcontractors (defined under Public Contract Code section 4113 and Business & Professions Code section 7026) to the prime contractor performing work in excess of 0.5% of the bid must be listed. **At time of bid**, Bidder must list the name and location of business, contractor's license number, trade/portion of work, and the DIR Registration Number of every listed subcontractor. **Within twenty-four (24) hours of the bid opening**, provide all required information on the Subcontractors List per Public Contract Code section 4104(a)(3)(A).

Percentage of Contract Value: The Bidder shall stipulate what percentage of work a subcontractor will perform in relation to the total bid value.

NOTE: AT TIME OF BID, LIST ALL DVB SUBCONTRACTORS ON BOTH THE DVB BIDDER DECLARATION AND THIS SUBCONTRACTORS LIST.

NON-COLLUSION DECLARATION

The undersigned declares:

I am the _____ of
_____, the party making the foregoing bid.

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

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on this _____ day of _____, 20____ at

(City, County and State)

By: _____
(Signature of Company Officer) (Date)

(Typed or Printed Name) (Title)

(Address) (Phone)

(City/State/Zip) (Email Address)

SAN DIEGO UNIFIED SCHOOL DISTRICT
BID SECURITY BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____

_____ as Principal, and

_____ as a Surety, are held and firmly bound unto SAN DIEGO UNIFIED SCHOOL DISTRICT hereinafter called the Owner, in the penal sum equal to: TEN PERCENT (10%) of the total amount of the Principal's Bid Proposal submitted to the Owner for the Work described below for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted the accompanying Bid Proposal dated _____, 20____, for the Work described as: _____

PROJECT NAME

NOW, THEREFORE, if the Principal shall not withdraw said Bid Proposal within the period specified therein after the opening of the same, or, if no period be specified, within ninety (90) days after said opening, and shall within the period specified therefore, or, if no period be specified, within five (5) days after the prescribed forms are presented to him for signature, enter into a written contract with the Owner, in accordance with the bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, or in the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bond within the time specified, if the Principal shall pay the Owner the difference between the amount specified in said Bid Proposal and the amount for which the Owner may procure the required work and/or supplies if the latter amount be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

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 anywise affect its obligations under this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said Contract or the Call for Bids, or to the work, or to the specifications.

In the event suit is brought upon this bond by the Owner and judgment is recovered, the Surety shall pay all litigation expenses incurred by the Owner in such suit, including reasonable attorneys' fees, court costs, expert witness fees and investigation expenses.

IN WITNESS WHEREOF the above-named parties have executed this instrument under their several seals this ____ day of _____, 20____.

 (Principal Name)

By: _____

 (Typed or Printed Name)

Title: _____

 (Surety Name)

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

 (Typed or Printed Name)

(Attach Attorney-in-Fact Certificate)

(____) _____ Phn (____) _____ Fax

(Area Code Telephone and Fax Number of Surety)

ELECTRONIC SIGNATURE ACKNOWLEDGEMENT & AGREEMENT

This Agreement governs the rights, duties, and responsibilities relating to the use of an electronic signature for Contract management with San Diego Unified School District ("District") through an electronic system established and maintained by the District.

1. Under the Uniform Electronic Transactions Act (California Civil Code sections 1633.1-1633.17), I agree to conduct transactions relating to the Contract by use of an electronic signature, which is an electronic mark that is held to the same standard as a legally binding equivalent of my handwritten signature. **I further agree that, for the purposes of authorizing, approving, and authenticating records, information, and transactions relating to the Contract, my electronic signature has the full force and effect of a signature affixed by hand to a paper document. I agree that the transactions I conduct electronically relating to the Contract shall be binding upon me.**
2. I agree that my electronic signature will be valid from date of issuance until it is revoked or terminated under this Agreement. I understand that the District may suspend, terminate, or revoke my electronic signature in its reasonable discretion.
3. I will use my electronic signature to establish my identity and sign electronic documents and forms relating to the Contract. I am solely responsible for protecting my electronic signature. If I suspect or discover that my electronic signature has been stolen, lost, used by an unauthorized party, or otherwise compromised, then I will immediately notify the Construction Manager Director or his/her designee and request that my electronic signature be revoked. I will then immediately cease all use of my electronic signature. I agree to keep my electronic signature secret and secure by taking reasonable security measures to prevent it from being lost, modified, or otherwise compromised, and to prevent unauthorized disclosure of, access to, or use of it or of any media on which information about it is stored.
4. I will immediately request that my electronic signature be revoked if I discover or suspect that it has been or is in danger of being lost, disclosed, compromised or subjected to unauthorized use in any way.
5. If I have requested that my electronic signature be revoked, if I am notified that someone has requested that my electronic signature be suspended, terminated, or revoked, or if I suspect or discover that it has been or may be compromised or subjected to unauthorized use in any way, I will immediately cease using my electronic signature. I will also immediately cease using my electronic signature upon termination of employment or termination of this Agreement.
6. I will not enter into an electronic signature for any person other than myself, unless I am designated in writing, as a proxy for such person relating to the Contract.

Please print or type your first and last name

Date

Please provide your email address

- ☐ I understand that by checking this box constitutes a legal signature confirming that I acknowledge and warrant the truthfulness of the information provided in this document. Please sign within the box below.

AGREEMENT

THIS AGREEMENT is entered into by and between the **SAN DIEGO UNIFIED SCHOOL DISTRICT**, a California Public School District hereinafter "District" and _____, "Contractor."

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

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

**FURNISH AND INSTALL WALK-IN FREEZERS AT
BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL**

- Contractor shall complete all Work covered by the Contract Documents, including without limitation, the Drawings and Specifications prepared by the Architects obrARCHITECTURE, inc. and other Contract Documents enumerated in Article 6 below, along with all modifications and addenda thereto issued in accordance with the Contract Documents.
2. **Contract Term.** The Work shall be commenced on the date stated in the District's Notice to Proceed; the Contractor shall achieve Substantial Completion of the Work within the Contract Time set forth in the Contract Documents.
3. **Compensation.** Contractor shall be compensated for the performance of its obligations under this Agreement as specified in the executed Bid Proposal, for the following items:

Item 1 Bell Middle School Base Bid:	<u>\$XXX,XXX.XX</u>
Item 2 Clairemont High School Base Bid:	<u>\$XXX,XXX.XX</u>
Allowances:	<u>\$XXX,XXX.XX</u>
Total Contract Price:	<u>\$XXX,XXX.XX</u>

The District's payment of the Contract Price shall be in accordance with the Contract Documents.

4. **Liquidated Damages.** In the event of the failure or refusal of the Contractor to achieve Substantial Completion of the Work of the Contract Documents within the Contract Time, as adjusted, the Contractor shall be subject to assessment of Liquidated Damages in accordance with the Contract Documents.
5. **Termination.** This Agreement may be terminated by the District upon seven (7) days written notice to Contractor. The District's right to terminate under this paragraph shall be in addition to any other rights reserved to the District under this Contract.
6. **The Contract Documents.** The documents forming a part of the Contract Documents consist of the following, all of which are component parts of the Contract Documents, and any other documents signed by both parties relating to the subject matter of the Agreement, all of which are incorporated by reference as though set forth in full herein.

Instructions to Bidders	Drug-Free Workplace Certificate
Bid Proposal	Guarantee
Unit Pricing (if applicable)	Contractor Certification – Background Checks
Subcontractors List	Employee List
Non-Collusion Declaration	Roofing Certification (if applicable)
Bid Security Bond	DVB Bidder Declaration

Electronic Signature Acknowledgement
 Agreement
 Labor and Material Payment Bond
 Performance Bond
 Certificate of Workers Compensation

General Conditions
 Supplementary Conditions
 Specifications
 Drawings
 Bid Addenda Nos. ____

7. **Electronic Signature.** Contractor/Consultant consents to conducting transactions for this Contract via electronic signature, which will have the same validity and effect as a signature affixed by hand, through an electronic system established and maintained by the District. Contractor/Consultant agrees that designated persons will sign an electronic signature acknowledgment and agreement attached and incorporated by reference on page E-8 _____ (Initials).
8. **Authority to Execute.** The individual(s) executing this Agreement on behalf of the Contractor is/are duly and fully authorized to execute this Agreement on behalf of Contractor and to bind the Contractor to each and every term, condition and covenant of the Contract Documents.

CONTRACTORS ARE REQUIRED BY LAW TO BE LICENSED AND REGULATED BY THE CONTRACTORS' STATE LICENSE BOARD. ANY QUESTIONS CONCERNING A CONTRACTOR MAY BE REFERRED TO THE REGISTRAR, CONTRACTORS' STATE LICENSE BOARD, P.O. BOX 2600, SACRAMENTO, CALIFORNIA 95826

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

CONTRACTOR**SAN DIEGO UNIFIED SCHOOL DISTRICT**

By: DO NOT SIGN
 (Signature of Company Officer)

By: _____

Title: _____

Title: _____

Date: _____

Date: _____

Contractor Name: _____

Address: _____

City, State, Zip: _____

Telephone: _____

Email: _____

APPROVED AS TO FORM AND LEGALITY

Approved in a public meeting of the Board of
 Education of the San Diego Unified School District
 on Date: _____

 Kimberly Chapin, Asst. General Counsel II
 San Diego Unified School District

 Marty Stultz, Director of Board Service
 Board of Education

APPROVED AS TO CONTENT

 Bryan Ehm, Director, Physical Plant Operations
 San Diego Unified School District

Project Name:
Bond No.:

NO. CP25-1029-52-00-00

**SAN DIEGO UNIFIED SCHOOL DISTRICT
FACILITIES PLANNING AND CONSTRUCTION
2351 CARDINAL LANE, BLDG. M
SAN DIEGO, CA 92123**

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____ as Principal, and as Surety _____ are held and firmly bound unto **SAN DIEGO UNIFIED SCHOOL DISTRICT** hereinafter "the Obligee", in the penal sum of _____ Dollars (\$_____) in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Obligee, by resolution of its Board of Trustees passed on _____, 20____, has awarded to the Principal a Contract for the Work described as: _____

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

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

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

The term "Claimant" shall refer to any person, corporation, partnership, proprietorship or other entity including without limitation, all persons and entities described in California Civil Code §§8004, 9100, (and generally Civil Code §8000 et seq., 9000 et seq.) providing or furnishing labor, materials or services used or reasonably required for use in the performance of the Work under the Contract Documents, without regard for whether such labor, materials or services were sold, leased or rented. This Bond shall inure to the benefit of all Claimants so as to give them, or their assigns and successors, a right of action upon this Bond.

In the event suit is brought on this Bond by any Claimant for amounts due such Claimant for labor, materials or services provided or furnished by such Claimant, the Surety shall pay for the same and reasonable attorneys fees pursuant to California Civil Code §§8150, 9550 (and generally Civil Code §8000 et seq., 9000 et seq.).

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, deletion, addition, or any other modification to the terms of the Contract Documents, the Work to be performed thereunder, the Specifications or the Drawings, or any other portion of the Contract Documents, shall in any way limit, restrict or otherwise affect its obligations under this Bond; the Surety hereby waives notice from the Obligee of any such change, extension of time, alteration, deletion, addition or other modification to the Contract Documents, the Work to be performed under the Contract Documents, the Drawings or the Specifications of any other portion of the Contract Documents.

Project Name:
Bond No.:

NO. CP25-1029-52-00-00

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

(Principal Name)

By: _____

(Typed or Printed Name)

Title: _____

(Surety Name)

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

(Typed or Printed Name)

(Attach Attorney-in-Fact Certificate)

() _____ Phn () _____ Fax
(Area Code Telephone and Fax Number of Surety)

E-Mail

Address for Notices:

Project Name:
Bond No.:

NO. CP25-1029-52-00-00

**SAN DIEGO UNIFIED SCHOOL DISTRICT
FACILITIES PLANNING AND CONSTRUCTION
2351 CARDINAL LANE, BLDG. M
SAN DIEGO, CA 92123**

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the San Diego Unified School District ("the District") has awarded to

_____ as Principal, a
contract dated the _____ day of _____, 20____, (the
"Contract"), which Contract is by this reference made a part hereof, for the work described as follows:

WHEREAS, Principal is required to furnish a bond in connection with the Contract, guaranteeing the faithful performance thereof;

NOW, THEREFORE, we, the undersigned Principal and as Surety are held and firmly bound unto the District in the sum of _____ dollars (\$ _____), to be paid to the District or its successors and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by the District, shall promptly and faithfully perform the covenants, conditions, and agreements of the Contract during the original term and any extensions thereof as may be granted by the District, with or without notice to Surety, and during the period of any guarantees or warranties required under the Contract, and shall also promptly and faithfully perform all the covenants, conditions, and agreements of any alteration of the Contract made as therein provided, notice of which alterations to Surety being hereby waived, on Principal's part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify, defend, protect, and hold harmless the District as stipulated in the Contract, then this obligation shall become and be null and void; otherwise it shall be and remain in full force and effect.

No extension of time, change, alteration, modification, or addition to the Contract, or of the work required there under, shall release or exonerate Surety on this bond or in any way affect the obligation of this bond; and Surety does hereby waive notice of any such extension of time, change, alteration, modification, or addition.

Whenever Principal shall be and declared by the District to be in default under the Contract, Surety shall promptly remedy the default, or shall promptly:

1. Undertake through its agents or independent contractors, reasonably acceptable to the District, to complete the Contract in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages, or, at Surety's election, or, if required by the District, to pay the penal sum.
2. 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 (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Sum, and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages; but, in any event, Surety's total obligations hereunder shall

Project Name:
Bond No.:

NO. CP25-1029-52-00-00

not exceed the amount set forth in the third paragraph hereof. The term "balance of the Contract Sum," as used in this paragraph, shall mean the total amount payable by the District to the Principal under the Contract and any amendments thereto, less the amount paid by the District to Principal.

Surety's obligations hereunder are independent of the obligations of any other surety for the performance of the Contract, and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing the District' rights against the others.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the District or its successors or assigns.

Surety may join in any arbitration proceedings brought under the Contract and shall be bound by any arbitration award.

In the event suit is brought upon this bond by the District, Surety shall pay reasonable attorney's fees and costs incurred by the District in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

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

Principal: _____
(Name of Firm)

Surety: _____
(Name of Firm)

By: _____
(Signature)

By: _____
(Signature)

(Printed Name)

(Printed Name)

Title: _____

Title: _____

Address for Notices:

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

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

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

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

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

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

By: _____
 _____ (Signature) _____ (Date)

 _____ (Typed or Printed Name) _____ (Title)

DRUG-FREE WORKPLACE CERTIFICATION

I, _____, am the _____ of _____
 (Print Name) (Title)

 (Contractor Name). I declare, state and certify to all of the following:

1. I am aware of the provisions and requirements of California Government Code §§8350 et seq., the Drug Free Workplace Act of 1990.
2. I am authorized to certify, and do certify, on behalf of Contractor that a drug free workplace will be provided by Contractor by doing all of the following:
 - A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in Contractor's workplace and specifying actions, which will be taken against employees for violation of the prohibition;
 - B. Establishing a drug-free awareness program to inform employees about all of the following:
 - (i) The dangers of drug abuse in the workplace;
 - (ii) Contractor's policy of maintaining a drug-free workplace;
 - (iii) The availability of drug counseling, rehabilitation and employee-assistance programs; and
 - (iv) The penalties that may be imposed upon employees for drug abuse violations;
 - C. Requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by subdivision (A), above, and that as a condition of employment by Contractor in connection with the Work of the Contract, the employee agrees to abide by the terms of the statement.
3. Contractor agrees to fulfill and discharge all of Contractor's obligations under the terms and requirements of California Government Code §8355 by, inter alia, publishing a statement notifying employees concerning: (a) the prohibition of any controlled substance in the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the Work of the Contract be given a copy of the statement required by California Government Code §8355(a) and requiring that the employee agree to abide by the terms of that statement.
4. Contractor and I understand that if the District determines that Contractor has either: (a) made a false certification herein, or (b) violated this certification by failing to carry out and to implement the requirements of California Government Code §8355, the Contract awarded herein is subject to termination, suspension of payments, or both. Contractor and I further understand that, should Contractor violate the terms of the Drug-Free Workplace Act of 1990, Contractor may be subject to debarment in accordance with the provisions of California Government Code §§8350, et seq.
5. Contractor and I acknowledge that Contractor and I are aware of the provisions of California Government Code §§8350, et seq. and hereby certify that Contractor and I will adhere to, fulfill, satisfy and discharge all provisions of and obligations under the Drug-Free Workplace Act of 1990.

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

Executed at San Diego, California

By: _____
 (Signature) (Date)

 (Typed or Printed Name) (Title)

GUARANTEE**DISTRICT: SAN DIEGO UNIFIED SCHOOL DISTRICT****PROJECT: FURNISH AND INSTALL WALK-IN FREEZERS AT
BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL****CONTRACTOR NAME:** _____

The Contractor hereby warrants and guarantees to the District that all work, materials, equipment and workmanship provided, furnished or installed by or on behalf of Contractor in connection with the above-referenced Project (the "Work") have been provided, furnished and installed in strict conformity with the Contract Documents for the Work, including without limitation, the Drawings and the Specifications. Contractor further warrants and guarantees that all work, materials, equipment and workmanship as provided, furnished and/or installed are fit for use as specified and fulfill all applicable requirements of the Contract Documents including without limitation, the Drawings and the Specifications. Contractor shall, at its sole cost and expense, repair, correct and/or replace any or all of the work, materials, equipment and/or workmanship of the Work, together with any other items which may be affected by any such repairs, corrections or replacement, that may be unfit for use as specified or defective within a period of two (2) years from the date of the District's Final Acceptance of the Work, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of the Contractor's failure and/or refusal to comply with the provisions of this Guarantee, within the period of time set forth in the Contract Documents after the District's issuance of the Notice to the Contractor of any defect(s) in the Work, materials, equipment or workmanship, Contractor authorizes the District, without further notice to Contractor, to repair, correct and/or replace any such defective item at the expense of the Contractor. The Contractor shall reimburse the District for all costs, expenses or fees incurred by the District in providing or performing such repairs, corrections or replacements within ten (10) days of the District's presentation of a demand to the Contractor for the same.

The provisions of this Guarantee and the provisions of the Contract Documents for the Work relating to the Contractor's Guarantee(s) and warranty(ies) relating to the Work shall be binding upon the Contractor's Performance Bond Surety and all successors or assigns of Contractor and/or Contractor's Performance Bond Surety.

The provisions of this Guarantee are in addition to, and not in lieu of, any provisions of the Contract Documents for the Work relating to the Contractor's guarantee(s) and warranty(ies) or any guarantee(s) or warranty(ies) provided by any material supplier or manufacturer of any equipment, materials or other items forming a part of, or incorporated into the Work, or any other guarantee or warranty obligation of the Contractor, prescribed, implied or imposed by law.

The undersigned individual executing this Guarantee on behalf of Contractor warrants and represents that he/she is duly authorized to execute this Guarantee on behalf of Contractor and to bind Contractor to each and every provision hereof.

By: _____
(Signature) (Date)

(Typed or Printed Name) (Title)

CONTRACTOR CERTIFICATION REGARDING BACKGROUND CHECKS

_____ certifies that it has performed one of the following:
 Name of Contractor/Consultant

- ☐ Pursuant to Education Code Section 45125.1, Contractor has conducted criminal background checks, through the California Department of Justice, of all employees providing services to the San Diego Unified School District, pursuant to the contract dated _____, and that none have been convicted of serious or violent felonies, as specified in Penal Code 1192.7(c) and 667.5(c), respectively.

OR

- ☐ Pursuant to Education Code Section 45125.2, Contractor will ensure the safety of pupils by one or more of the following methods:

- ☐ 1) The installation of a physical barrier at the worksite to prevent contact with pupils (i.e. 8 foot chain link fencing).

AND

- ☐ 2) Continual supervision and monitoring of all employees of the entity by an employee of the entity, such as foremen, whom the Department of Justice has ascertained has not been convicted of a violent or serious felony.

OR

- ☐ 3) Will execute the required Department of Justice application and send either all employees or supervising and monitoring employees for fingerprinting at an authorized processing center. ***Prior to performing work on site Contractor must provide certification that the required employees have been fingerprinted.***

Contact www.oag.ca.gov to obtain an ORI number or more information from the Department of Justice regarding this requirement.

AND

Included as "Attachment A" is a list of the names of the employees of the undersigned who will be working on the project and who, to the best knowledge of the undersigned, are not convicted felons or awaiting trial for a felony charge.

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

Date: _____, 20____

 Signature

 Title

LIST OF EMPLOYEES
"ATTACHMENT A"

The following is a list of our employees and our subcontractor's employees and their DOJ fingerprinting status who will be working on the project site(s). I will keep this list current and send the District's Construction Manager any new updates with my monthly payment application.

<u>NAME and TITLE</u>	<u>EMPLOYER</u>	<u>FINGERPRINTED?</u>	
		Yes	No
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

_____	_____
Contact Name (Officer or Employee)	Title

Authorized Signature

Telephone Number

**SAN DIEGO UNIFIED SCHOOL DISTRICT**

DISABLED VETERAN BUSINESS (DVB)**PARTICIPATION PROGRAM OVERVIEW AND RESOURCES**

1. **Disabled Veteran Business (DVB).** The term Disabled Veteran Business (DVB) includes certified Small Business Administration (SBA) Service-Disabled Veteran-Owned Small Businesses (SDVOSBs) and certified California Department of General Services (DGS) Disabled Veteran Business Enterprises (DVBES). The District accepts both certifications.

DVB Participation Program Policy. The District encourages contractors to ensure maximum opportunities for DVBs in the Work of the Contract through the DVB Participation Program.

Pursuant to a board-approved resolution in support of DVBs, the District has replaced the good faith effort with a mandatory requirement of 3% for DVB participation on all District construction projects, regardless of size. Contractor must meet or exceed 3% DVB participation either directly through the General Contractor, or via subcontractors, lower tier subcontractors, suppliers, equipment providers, and/or manufacturers. The failure of any Contractor to strictly comply with the District's DVB Participation Program Policy may result in rejection of the Bid Proposal for non-responsiveness or incompleteness. Businesses that act as Brokers, Fronts, and Pass-throughs are not permitted; all DVBs must provide a Commercially Useful Function.

The District's commitment to the achievement of DVB Participation Requirement for the Work of the Contract shall not, however, result in the District's discrimination in the award of the Contract on the basis of ethnic group identification, ancestry, religion, age, sex, race, color, or physical or mental disability.

Information regarding the DVB Participation Program, including links to find certified DVBs, is available at www.sandiegounified.org/DVB.

2. **Definitions.**

- 2.1 **Broker.** A DVB contractor that does not have title, possession, control, and risk of loss of materials, supplies, services, or equipment provided, unless one or more of the disabled veteran owners has at least fifty-one percent (51%) ownership of the quantity and value of the materials, supplies, and equipment provided [Military and Veterans Code (MVC) Section 999.2(b)].
- 2.2 **Commercially Useful Function (CUF).** A "commercially useful function" (CUF) provides services or goods that contribute to the fulfillment of the contract requirements. It is not a CUF if the DVB's role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed, in order to obtain the appearance of DVB participation. A CUF is a person or entity doing all of the following:
 - a. is responsible for the execution of a distinct element of the work of the contract;
 - b. carries out the obligation by actually performing, managing, or supervising the work involved;
 - c. performs work that is normal for its business services and functions; and
 - d. is not further subcontracting a portion of the work that is greater than that expected to be subcontracted by normal industry standards.
- 2.3 **Disabled Veteran.** A "Disabled Veteran" means a veteran of the military, naval, or air service of the United States with at least ten percent (10%) service-connected disability who is a resident of the State of California.

**SAN DIEGO UNIFIED SCHOOL DISTRICT**

- 2.4 **Disabled Veteran Business (DVB).** The term “DVB” includes certified Small Business Administration (SBA) Service-Disabled Veteran-Owned Small Businesses (SDVOSBs) and certified California Department of General Services (DGS) Disabled Veteran Business Enterprises (DVBEs).
- 2.5 **Disabled Veteran Business Enterprise (DVBE).** A “DVBE” means a business enterprise that has been certified by the California Department of General Services. A DVBE is 51% owned by one or more disabled veterans; management and daily operations are controlled by one or more disabled veterans but need not be those who own the business; and home office located in the United States which is not a branch or subsidiary of a foreign corporation. See California Military & Veterans Code, §999(b)(7)(A).
- 2.6 **Front.** A “Front” is a subcontractor providing artificial or incidental participation to meet the objective of a contract (e.g., DVB participation requirement), or a provider who does not own the equipment they are providing, but going through an outside source.
- 2.7 **Pass-through.** A “Pass-through” means a supplier providing access to materials and supplies for which they are not specifically certified/verified. Also see “Front” above.
- 2.8 **Service-Disabled Veteran.** A “Service-Disabled Veteran” is a person who served in the active military, naval, or air service, and who was discharged or released under conditions other than dishonorable, and whose disability was incurred or aggravated in line of duty in the active military, naval, or air service.
- 2.9 **Service-Disabled Veteran-Owned Small Business (SDVOSB).** An “SDVOSB” is a business enterprise that has been certified by the U.S. Small Business Administration. An SDVOSB must be at least 51% owned by an individual who is considered, by the government, a service-disabled veteran, or for a publicly quoted business, at least 51% of the stock is owned by one or more service-disabled veterans, and the management and daily business operations are controlled by one or more service-disabled veterans.

3. DVB Participation Requirement.

- 3.1 **DVB Participation Requirement.** The Bid Proposal of a bidder may be deemed non-responsive if the bidder does not meet or exceed the DVB Participation Requirement of three percent (3%) of total amount of bidder's bid price including all allowances.

DVBEs are required to have a current and valid certification from the State of California Department of General Services for the business type and classification as listed on the bid documents. SDVOSBs need to have a current and valid certification from the U.S. Small Business Administration relevant to the bid (e.g., NAICS Code); self-certification will not be accepted. Eligibility must be current at time of bid opening and contract award. If requested by the District, Bidders will need to submit certification(s) within twenty-four (24) hours of the request.
- 3.2 **Exclusions.** The District expressly prohibits Brokers, Pass-throughs, and Fronts.
- 3.3 **DVB Substitution Requirements.** See the General Conditions, Subcontractor Substitution Article 5.2.2 for DVB-specific substitution process requirements.



DVB RESOURCE INFORMATION

Hyperlinks to the resources below can be found at the Business Outreach webpage, www.sandiegounified.org/business-outreach:

- District's Disabled Veteran Business Participation Tip Sheet
- Federal SDVOSB database
- State of California's DVBE database
- United States Veteran Business Alliance (USVBA) website
- Veterans in Business (VIB) Network website

The District's Business Outreach Team can be reached for assistance:

1. Karen Linehan, Outreach Program Manager at klinehan@sandi.net
2. Alma D. Bañuelos, Business Outreach Coordinator at abanuelos@sandi.net
3. Sidney Hucklebridge-Key, Lease-Leaseback Outreach Coordinator at shucklebridge@sandi.net

DISABLED VETERAN BUSINESS (DVB) BIDDER DECLARATION

1. **Bidder Name:** _____
2. **Do you hold a current DVB certification?** Please identify which certification: ☐ DVBE ☐ SDVOSB ☐ N/A
3. **DVB Subcontractor/Supplier List: FIRST TWO COLUMNS MUST BE COMPLETED AT TIME OF BID.**

You may attach additional pages if necessary. Bidder shall submit within 24 hours of the bid opening a DVB Bidder Declaration with **all columns completed**. Subcontractors/suppliers listed **must** possess a current and valid California Department of General Services DVBE certification or U.S. Small Business Administration SDVOSB certification or their percentage will not count toward the Participation Requirement.

Complete at time of bid		Submit within 24 hours of bid opening			
Subcontractor/Supplier Name, Address, Contact Person, Phone Number, and Email	California DVBE or Federal SDVOSB Certification	Bidder Name or Hiring Subcontractor	Provide UNSPSC, NAICS, and/or CSLB Classification Number(s) and list work to be performed or specific supplies	Estimated DVB Dollar Value	Corresponding % of Total Bid Price

4. **CERTIFICATION:** By executing and submitting this DVB Bidder Declaration, I represent to the District that each DVB identified is duly and properly certified in conformity with the District's DVB Participation Program Policy and all applicable laws. I also acknowledge that the District has a mandatory requirement of **three percent (3%)** for DVB participation on all construction projects regardless of value and certify that our company **will meet or exceed 3%** DVB participation on this project. **I understand that if the District cannot verify the Participation Requirement with the subcontractors/suppliers listed, the bid will be deemed non-responsive.**

Submit within 24 hours of bid opening		
Total Bid Price Including All Allowances	Total DVB Dollar Value (\$) Committed	Total DVB Percentage (%) Committed

5. **AUTHORITY TO EXECUTE:** The individual executing this DVB Bidder Declaration on behalf of the bidder warrants and represents to the District that they are duly authorized to execute this document on behalf of the Bidder.

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

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

(Sign)

(Name of Individual Executing Statement)

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ARTICLE 1**1. DEFINITIONS – GENERAL****1.1. ARCHITECT**

1.1.1. The Architect is the person or entity identified as such in the Agreement; references to the "Architect" in the Contract Documents shall mean the Architect or the Architect's authorized representative. Unless otherwise stated, references in the Contract Documents to "the Architect" are references to the Architect or Architectural Firm retained by the District specifically for the Work and not the District Architect.

1.2 CONSTRUCTION EQUIPMENT

1.2.1. The term "Construction Equipment" shall be deemed to refer to equipment utilized for the performance of any portion of the Work, but which is not incorporated into the Work.

1.3. CONSTRUCTION MANAGER

1.3.1. The Construction Manager is authorized and empowered to represent the District in construction supervisory and coordination activities and as provided for in the Contract Documents, including the authority to issue Field Work Orders on behalf of the District.

1.4. SUPERINTENDENT

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

1.5. CONTRACT DOCUMENTS

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

1.5.2. Organization of the Specifications into divisions, sections or Articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade or craft involved.

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

1.5.4. Conflicts in the Contract Documents shall be resolved by the Architect in accordance with Article 19 herein.

1.6. CONTRACT DOCUMENT TERMS

1.6.1. As used in the Contract Documents, the term "provide" shall mean "provide complete in place" or to "furnish and install" such item. The terms "approved;" "directed;" "satisfactory;" "accepted;" "acceptable;" "proper;" "required;" "necessary" and "equal" shall mean as approved, directed, satisfactory, accepted, acceptable, proper, required, necessary and equal, in the opinion of the Architect in consultation with the District's Representative. The term "typical" as used in the Drawings shall require the installation or furnishing of such item(s) of the Work designated as "typical" in all other areas similarly marked as "typical"; Work in such other areas shall conform to that shown as "typical" or as reasonably inferable therefrom.

1.7. CONTRACTOR

1.7.1. The Contractor is the person or entity identified as such in the Agreement; references to "Contractor" in the Contract Documents shall mean the Contractor or the Contractor's authorized representative.

1.8. CRITICAL PATH

1.8.1. The term "critical path" as used in the Contract Documents shall mean the construction activity schedule that establishes the minimum overall Project duration.

1.9. DAY

1.9.1. The term "day" as used in the Contract Documents shall mean consecutive calendar day unless otherwise specifically defined.

1.10. DEFECTIVE OR NON-CONFORMING WORK

1.10.1. Defective or non-conforming Work is any Work which is unsatisfactory, faulty or deficient by: (a) not conforming to the requirements of the Contract Documents; (b) not conforming to the standards of Workmanship of the applicable trade or industry; (c) not being in compliance with the requirements of any inspection, reference, standard, test, or approval required by the Contract Documents; or (d) damage occurring prior to Final Completion of all of the Work.

1.11. DELIVERY

1.11.1. The term "delivery" used in conjunction with any equipment, materials or other items to be incorporated into the Work shall mean the unloading and storage in a protected condition pending incorporation into the Work.

1.12. DISTRICT

1.12.1. The term "District" shall refer to the San Diego Unified School District, the District's Board of Education and the District's officers, employees, agents and representatives.

1.13. DIVISION OF STATE ARCHITECT ("DSA")

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

1.14. DRAWINGS AND SPECIFICATIONS

1.14.1. The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing generally, the scope, design, extent, location, character and dimensions of the Work and may include without limitation, plans, elevations, sections, details, schedules or diagrams. Shop Drawings are not drawings as so defined herein. The Specifications are the portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards, criteria and Workmanship for the Work and related services. The Drawings and Specifications are intended to delineate and describe the Work and its component parts so as to permit skilled and competent Contractors to bid upon the Work and prosecute the same to completion.

1.15. FIELD CLARIFICATIONS

1.15.1. Field Clarifications in the form of Field Work Orders are written or graphic documents, consisting of supplementary details, instructions or information issued on behalf of the

District, which clarifies or supplements the Contract Documents and which becomes a part of the Contract Documents upon issuance. Field Clarifications do not constitute an adjustment of the Contract Time or the Contract Price, unless a Change Order relating to a Field Clarification is authorized and issued.

1.16. MATERIAL SUPPLIER

1.16.1. A Material Supplier is any person or entity that only furnishes materials, equipment or supplies for the Work without fabricating, installing or consuming them in the performance of the Work of the Contract.

1.17. NOTICE TO PROCEED ("NTP")

1.17.1. The Notice to Proceed (NTP) is the written notice issued by or on behalf of the District to the Contractor authorizing the Contractor to proceed with commencement of the Work or portions of the Work and which establishes the date for commencement of the Contract Time.

1.18. PARTIAL USE OR OCCUPANCY

1.18.1. Use or occupancy by the District of a partially completed portion, part, space or area of the Work prior to 100% Substantial completion of all the Work.

1.19. PROGRESS REPORTS; VERIFIED REPORTS

1.19.1. Progress Reports, if required, are written reports prepared by the Contractor and periodically submitted to the District in the form and content as required by the Contract Documents. Verified Reports are periodic written reports prepared by the Contractor and submitted to DSA; Verified Reports shall be in such form and content as required by the applicable provisions of Title 24 of the California Code of Regulations. Preparation of complete and accurate Progress Reports, as required in Division 1, and Verified Reports, as well as the timely submission of the same are material obligations of the Contractor.

1.20. THE PROJECT

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

1.21. PROJECT MANAGER

1.21.1. The Project Manager is authorized and empowered to act on behalf of the District in administering the Architect's Contract and as set forth in the Contract Documents.

1.22. PROJECT INSPECTOR

1.22.1. The Project Inspector is the individual designated and employed by the District in accordance with the requirements of Title 24 of the California Code of Regulations. The Project Inspector shall be authorized to act on behalf of the District as provided for in the Contract Documents and in Title 24 of the California Code of Regulations, as the same may be amended from time to time.

1.23. RECORD DRAWINGS

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

1.24. SHOP DRAWINGS; SAMPLES; PRODUCT DATA ("SUBMITTALS")

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

1.25. SITE

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

1.26. SUPPLEMENTARY CONDITIONS

1.26.1. Supplementary Conditions are supplemental provisions which apply to the Work that are not otherwise provided for in the Agreement or the General Conditions.

1.27. SUBCONTRACTORS; SUB-SUBCONTRACTORS

1.27.1. A Subcontractor is a person or entity that has a direct Contract with the Contractor to perform a portion of the Work at the Site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means any Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate Contractor to the District or Subcontractors of any separate Contractor. A Sub-Subcontractor is a person or entity of any tier, who has a direct or indirect Contract with a Subcontractor to perform a portion of the Work at the Site. The term "Sub-Subcontractor" is referred to throughout the Contract Documents as if singular in number and means any Sub-Subcontractor, of any tier, or an authorized representative of any Sub-Subcontractor.

1.28. SUBSTANTIAL COMPLETION

1.28.1. Substantial Completion is that stage in the progress of the Work when all the Work is 100% complete in accordance with the Contract Documents including receipt of final warranties, commissioning reports, guarantees and record document submittals such that the District can occupy or use all the Work for its intended purpose.

1.29. SURETY

1.29.1. The Surety is the person or entity that executes, as surety, the Contractor's Labor and Material Payment Bond and/or Performance Bond.

1.30. THE WORK

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

ARTICLE 2**2. DISTRICT****2.1. INFORMATION AND SERVICES REQUIRED OF DISTRICT**

- 2.1.1. The District shall furnish information or services to be provided by the District under the Contract Documents with reasonable promptness to avoid delay in the orderly progress of the Work. Information about existing conditions or present improvements on or about the Site, furnished by the District to the Contractor, is obtained from sources believed to be reliable. The District neither guarantees nor warrants that such information is complete and accurate. The Contractor shall verify all information provided by the District and shall notify the District of any discrepancies pursuant to Article 4.1 herein.
- 2.1.2. Information, if any, concerning physical characteristics of the Site, including without limitation, surveys and utility locations, to be provided by the District are set forth in the Contract Documents. Information not provided by the District, which is required for Contractor's completion of the Work, shall be obtained by Contractor without adjustment to the Contract Price or the Contract Time. The soils reports (geotechnical reports) are not part of the Contract Documents but are available for the Contractor's examination.
- 2.1.3. The District shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities, which are expressly identified as the District's responsibility in connection with the Work. The Contractor's responsibilities for obtaining the same are set forth in the Contract Documents.
- 2.1.4. 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 excise tax because it is a sale to a state or local government for its exclusive use, the District, upon written request, will execute a certificate of exemption which will certify (i) that the District is a political subdivision of the state for the purposes of such exemption; and (ii) that the sale is for the exclusive use of the District. No excise tax for such materials shall be included in any Contract price.
- 2.1.5. Except as otherwise provided for in the Contract Documents, the District shall furnish the Contractor, free of charge, the number of copies of the Drawings and the Specifications as set forth in the Supplementary Conditions. All of the Drawings and the Specifications provided by the District to the Contractor remain the property of the District; the Contractor shall not use the same in connection with any other Work of improvement other than the Work of the Project.

2.2. DISTRICT'S RIGHT TO STOP THE WORK

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

2.3. PARTIAL OCCUPANCY OR USE

- 2.3.1. The District may occupy or use any completed or partially completed portion of the Work upon ten (10) days' notice to Contractor, provided that: (i) the District has obtained the consent of, or is otherwise authorized by, public authorities with jurisdiction thereof to so occupy or use such portion of the Work and (ii) the District and the Contractor have accepted, in writing, the responsibilities assigned to each of them for payments, retention (if any), security, maintenance, utilities, damage to the Work, insurance and the period for correction of the Work and commencement of warranties required by the Contract Documents for such portion of the Work partially used or occupied by the District.
- 2.3.2. In the event the Contractor and the District are unable to agree upon the matters set forth in (2.3.1.) above, the District may nevertheless use or occupy any completed or partially completed portion of the Work, with the responsibility for such matters subject to resolution in accordance with the Contract Documents. Immediately prior to such partial occupancy or use of the Work, or portions thereof, the Project Inspector, Contractor, and the Architect shall jointly inspect the portions of the Work to be occupied or to be used to determine and record the condition of the Work. The District's use or occupancy of portions of the Work pursuant to the preceding shall not be deemed an event of "completion" under Public Contract Code §7107.
- 2.3.3. Unless otherwise expressly agreed upon by the District and the Contractor, the District's partial occupancy or use of the Work or any portion thereof, shall not constitute the District's acceptance of the Work that fails to comply with the requirements of the Contract Documents or which is otherwise defective

2.4. PROHIBITED INTERESTS

- 2.4.1. No official of the District who is authorized in such capacity and on behalf of the District to negotiate, make, accept, or approve, or to take part in negotiating, making, accepting or approving any Architectural, engineering, inspection, construction or material supply Contract or any Subcontract in connection with construction of the Project, shall become directly or indirectly interested financially in this Contract or in any part thereof. No officer, employee, Architect, attorney, engineer or Project Inspector of or for the District who is authorized in such capacity and on behalf of the District to exercise any executive, supervisory or other similar functions in connection with construction of the Project shall become directly or indirectly interested financially in this Contract or in any part thereof.

ARTICLE 3**3. ARCHITECT – DUTIES OF****3.1. ARCHITECT'S RESPONSIBILITIES**

- 3.1.1. The purpose of this Article is to provide the Contractor with information on the role and responsibilities of the Architect. This Article does not direct the Work of the Architect. The Architect's Work is directed by the Architects' Contract which is not a part of this Agreement.
- 3.1.2. The Architect shall assist the District in administration of the Contract as described in the Contract Documents, and shall be one of the District's representatives during construction until the time that Final Payment is due the Contractor under the Contract Documents. The Architect shall advise and consult with the Construction Manager, Project Manager, and the Project Inspector with respect to the administration of the Contract and the Work.
- 3.1.3. The Architect is authorized to act on behalf of the District to the extent provided for in the Contract Documents; and shall have the responsibilities and powers established by law, including Title 24 of the California Code of Regulations. Nothing contained in the Contract Documents shall create any Contractual relationship between the Architect and the Contractor.
- 3.1.4. The Architect shall visit the Site weekly or at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the completed Work and to determine, in general, if the Work is being performed in a manner indicating that the Work, when completed, shall be in accordance with the Contract Documents. The Architect shall not be required to make exhaustive or continuous Site inspections to check quality or quantity of the Work. On the basis of Site observations as an Architect, the Architect shall keep the District informed of the progress of the Work, and shall endeavor to guard the District against defects and deficiencies in the Work. At the District's sole discretion, the District may require more frequent site visits by the Architect to prevent Project delays.
- 3.1.5. The Architect and the Project Inspector are authorized to reject Work that is defective, unsafe, or does not conform to the requirements of the Contract Documents. Whenever the Architect or Project Inspector consider it necessary or advisable, for implementation of the intent of the Contract Documents, the Architect and the Project Inspector shall each have authority to require additional inspections or testing of the Work, whether such Work is fabricated, installed, or completed.
- 3.1.6. The Architect shall conduct observations to determine the date or dates of Substantial Completion and the date of Final Completion, shall receive and forward to the District, for the District's review and records, written warranties and related documents required by the Contract Documents and assembled by the Contractor, and shall verify that the Contractor has complied with all requirements of the Contract Documents and is entitled to receipt of Final Payment.
- 3.1.7. The Architect shall interpret and decide matters concerning the requirements of the Contract Documents on written request of either the District or the Contractor. The Architect's response to such requests shall be made with reasonable promptness and within the time limits agreed upon, if any, and in no event to exceed a five (5) working day period from receipt of the request. Interpretations and decisions of the Architect shall be consistent with the intent of and reasonably inferable from the Contract Documents and shall be in writing or in the form of Drawings. When making such interpretations and decisions, the Architect shall endeavor to secure faithful performance by both the District and the Contractor, shall not show partiality to either and shall not be liable for results of interpretations or decisions so rendered in good faith.

3.2. TERMINATION OF ARCHITECT; SUBSTITUTE ARCHITECT

- 3.2.1. In case of termination of employment of the Architect, the District shall appoint a substitute Architect whose status under the Contract Documents shall be that of the Architect.

ARTICLE 4

4. CONTRACTOR – DUTIES OF

4.1. CONTRACTOR REVIEW OF CONTRACT DOCUMENTS

- 4.1.1. The Contractor shall carefully study and compare the Contract Documents with information furnished by the District pursuant to the Contract Documents and shall at once report to the Architect any errors, inconsistencies or omissions discovered by issuing a Request for Information (RFI) to the Architect. If the Contractor performs any Work that the Contractor knows, or with reasonable diligence should know, involves an error, inconsistency or omission in the Contract Documents without prior notice to the Architect, the Contractor shall assume full responsibility for such performance and bear all attributable costs for correction of the same.
- 4.1.2. If at any time the Contractor encounters any condition which the Contractor believes, in good faith and with reasonable basis, is the result of an ambiguity, conflict, error or omission in the Contract Documents (collectively “the Conditions”), it shall be the affirmative obligation of the Contractor to timely notify the Architect, in writing via an RFI, of the Conditions encountered and to request information from the Architect necessary to address and resolve any such Conditions. The Contractor shall act with promptness in submitting any such written RFI so as to allow the Architect a reasonable period of time to review, evaluate and respond to any such request. If the Contractor submits an RFI on a schedule activity within five (5) days or less of float on the most current Project CPM schedule, the Contractor shall not be entitled to any time extension provided that the Architect responds to the RFI within the five (5) working days set forth in Article 3.1.7.
- 4.1.3. If the Contractor fails to timely notify the Architect in writing of any Conditions encountered and the Contractor proceeds to perform any portion of the Work containing or affected by such Conditions, the Contractor shall bear all costs associated with or required to correct, remove, or otherwise remedy any portion of the Work affected thereby without adjustment of the Contract Time or the Contract Price.
- 4.1.4. The Architect's responses to any such Contractor RFI shall conform to the standards and time frame set forth in Article 3.1.7 of these General Conditions. A response to an RFI is not an authorization to proceed with any Work that the Contractor considers to be an impact to the time or cost of the Work. Changes to the Contract Time or the Contract Price shall be governed by the provisions of Article 10.1 hereof.
- 4.1.5. The foregoing provisions notwithstanding, in the event that the Architect reasonably determines that any of Contractor's RFI's (i) do(es) not reflect adequate or competent supervision or coordination by the Contractor or any Subcontractor; or (ii) do(es) not reflect the Contractor's adequate or competent knowledge of the requirements of the Work or the Contract Documents; or (iii) is/are not justified for any other reason, Contractor shall be liable to the District for all costs incurred by the District associated with responding to any such request for information, including without limitation, fees of the Architect and any other design consultant to the Architect or the District which shall be deducted from the Contract Price.
- 4.1.6. Prior to commencement of the Work, or portions thereof, the Contractor shall take field measurements and verify field conditions at the Site and shall carefully compare such field measurements and conditions and other information known to the Contractor with information provided in the Contract Documents. Errors, inconsistencies or omissions discovered shall be reported in writing to the Architect at once.
- 4.1.7. The Contractor shall be solely responsible for measuring dimensions and coordinating the Work of the Contract Documents. Scaling of the Contract Documents is not permitted. All field engineering required for laying out the Work and establishing grades for earthwork operations shall be by the Contractor at its expense. Any field engineering or other

engineering to be provided or performed by the Contractor under the Contract Documents and required or necessary for the proper execution or installation of the Work shall be provided and performed by an engineer duly registered under the laws of the State of California in the engineering discipline for such portion of the Work.

4.2. SITE INVESTIGATION; SUBSURFACE CONDITIONS

- 4.2.1. The Contractor shall be responsible for, and by executing the Agreement acknowledges, that it has carefully examined the Site and has taken all steps it deems reasonably necessary to ascertain all conditions which may affect the Work, or the cost thereof, including, without limitation, conditions bearing upon transportation, disposal, handling or storage of materials; availability of labor or utilities; access to the Site; and the physical conditions and the character of equipment, materials, labor and services necessary to perform the Work. If the Contractor reasonably determines there is an existing condition which is materially different than depicted in the Contract Documents or at the time of bid, Contractor shall immediately notify the District and the Architect in writing of the same in accordance with Article 4.1.2 herein.
- 4.2.2. By executing the Agreement, the Contractor acknowledges that it has examined the boring data and other subsurface data available and satisfied itself as to the character, quality and quantity of surface and subsurface materials, including without limitation, obstacles which may be encountered in performance of the Work, insofar as this information is reasonably ascertainable from an inspection of the Site, review of available subsurface data and analysis of information furnished by the District under the Contract Documents. The Contractor shall examine all boring and other subsurface data to make its own independent interpretation of the subsurface conditions and acknowledges that its bid is based upon its own opinion of the conditions that may be encountered. The District assumes no responsibility for any conclusions or interpretations made by Contractor on the basis of available subsurface data or other information furnished by District under the Contract Documents.
- 4.2.3 When digging trenches or other excavations that extend deeper than four feet below the surface (per Public Contract Code §7104):
 - 4.2.3.1 Contractor shall promptly, and before the following conditions are disturbed, notify District, in writing, of any material that the Contractor believes may be material that is hazardous waste, as defined in §25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law. Contractor shall notify District in writing of subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids. Contractor shall notify District in writing of 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.
 - 4.2.3.2 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 in the contract.
 - 4.2.3.3 In the event that a dispute arises between the 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 which pertain to the resolution of disputes and protests between the contracting parties.

- 4.2.3.4 Time or cost adjustments will not be allowed unless the Contractor has given notice as indicated above.

4.3. SUPERVISION AND CONSTRUCTION PROCEDURES

- 4.3.1. The Contractor shall supervise and direct performance of the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures, and for safety precautions and programs, and for coordinating all portions of the Work under the Contract Documents. The Contractor shall be responsible for inspection of portions of Work already performed under the Contract Documents to determine that such portions are in proper condition to receive subsequent Work.
- 4.3.2. The Contractor shall be responsible to the District for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and all other persons performing any portion of the Work under a Contract with the Contractor. The Contractor shall not be relieved of the obligation to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager, Project Manager, Project Inspector, or the Architect in the administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor. The Contractor must maintain on the job site contemporaneous daily construction reports that record, at a minimum, weather conditions, weather effects, visitors to the Site, meetings/conversations, inspections made and results, problems encountered, materials delivered, equipment delivered, material procurement problems, safety meetings/issues, accidents, description of actions initiated to correct reported deficiencies, and detailed descriptions of all Work activities, including Work location, Subcontractor name, crew size, equipment utilized, identification of change order Work and identification of the beginning and ending of significant activities.
- 4.3.3. The Contractor shall prepare, or cause to be prepared, all detailed surveys necessary for performance of the Work, including without limitation, slope stakes, points, lines and elevations. The Contractor shall be responsible for the establishment, location, maintenance and preservation of benchmarks, reference points and stakes for the Work. The cost of any surveys and the establishment, location, maintenance and preservation of benchmarks, reference points and stakes shall be included within the Contract Price. The Contractor shall be solely responsible for all loss or costs resulting from the loss, destruction, disturbance or damage of benchmarks, reference points or stakes.
- 4.3.4. Unless otherwise provided elsewhere in the Contract Documents, the Contractor shall arrange for the furnishing of and shall pay the costs of all utility services, including, without limitation, electricity, water, gas, voice, data, fire and intrusion alarm necessary for performance of the Work and the Contractor's obligations under the Contract Documents. The Contractor shall furnish and install necessary or appropriate temporary distributions of utilities, including meters, to the Site. The Contractor, upon completion of the Work, shall remove any such temporary distributions. The costs of all such utility services, including the installation and removal of temporary distributions thereof, shall be borne by the Contractor and included in the Contract Price.
- 4.3.5. In accordance with California Government Code §4215, the District shall assume the responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Site which are not identified in the Drawings, Specifications or other Contract Documents. Contractor shall be compensated for the costs of locating or repairing damage not due to the Contractor's failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Contract Documents with reasonable accuracy, and for equipment on the Site necessarily idled during such Work.

Contractor shall not be assessed Liquidated Damages for delay in completion of the Work when such delay is caused by the failure of the District or the owner of the utility to provide for removal or relocation of such utility facilities.

- 4.3.6. The District is not required to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, meters and junction boxes, on or adjacent to the Site. In the event that Contractor, in performing the Work, shall encounter utility facilities not identified by the District in the Contract Documents, the Contractor shall immediately notify, in writing, the District, the Architect, and the utility owner. In the event that such utility facilities are owned by a public utility, the public utility shall have the sole discretion to perform repairs or relocation Work or permit the Contractor to do such repairs or relocation Work at a reasonable price
- 4.3.7. Within ten (10) days of the date of the District's Board of Education action awarding the Contract, the Contractor shall submit to the District a list of the individuals authorized to execute documents and instruments relating to the Work and the Contract Documents on behalf of the Contractor and to bind the Contractor to its obligations under such documents or instruments. If the Contractor is a corporation, in addition to the list of authorized representatives, the Contractor shall concurrently submit a duly certified resolution of the Contractor's Board of Directors reflecting authorization or ratification of the authority conferred upon each of the individuals on the list submitted in accordance with the provisions hereof.
- 4.3.8. The Contractor shall enforce strict discipline and good order among the Contractor's employees, the employees of any Subcontractor or Sub-Subcontractor and all other persons performing any part of the Work at the Site. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. The Contractor shall dismiss from its employ, and direct any Subcontractor or Sub-Subcontractor to dismiss from their employment; any person deemed by the District to be unfit or incompetent to perform Work and shall not reemploy such person without the prior written consent of the District. The District reserves the right to interview and accept or reject proposed personnel, including but not limited to the Project Manager, Project Engineer, Superintendent, Assistant Superintendents, Scheduler and Safety Representative. Personnel assigned and accepted by the District shall be maintained throughout the Project, unless otherwise accepted by the District.
- 4.3.9. The Contractor shall employ a competent full time English speaking Superintendent and all necessary assistants who shall be in attendance at the Site at all times during performance of the Work. The Contractor's communications relating to the Work or the Contract Documents shall be through the Contractor's Superintendent. The Superintendent shall represent the Contractor and communications given to the Superintendent shall be binding as if given to the Contractor. The Contractor shall dismiss the Superintendent or any of his/her assistants if they are deemed, in the sole reasonable judgment of the District, to be unfit, incompetent or incapable of performing the functions assigned to them. In such event, the District shall have the right to approval of the replacement of Superintendent or assistant. The Contractor shall designate a separate Superintendent for each construction site included within the Work.

4.4. LABOR AND MATERIALS

- 4.4.1. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, Construction Equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

4.5. TAXES

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

4.6. PERMITS, FEES AND NOTICES; COMPLIANCE WITH LAWS

- 4.6.1. Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permits, other permits, governmental fees, licenses and inspections necessary or required for the proper execution and completion of the Work.
- 4.6.2. The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and other orders of public authorities bearing on performance of the Work.
- 4.6.3. If the Contractor knows, or has reason to believe, that any portion of the Contract Documents are at variance with applicable laws, statutes, ordinances, building codes, regulations or rules, the Contractor shall promptly notify the Architect and the Project Inspector, in writing, of the same. If the Contractor performs Work knowing, or with reasonable diligence should have known, it to be contrary to such laws, applicable to the Work without prior notice, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs arising or associated therefrom, including without limitation, the removal, replacement or correction of the same.
- 4.6.4. The Contractor shall comply with all conditions of the State Water Resources Control Board ("State Water Board") National Pollutant Discharge Elimination System General Permit (NPDES) for Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activities Order No. 2009-009-DWQ ("Storm Water Construction General Permit") for all construction activity which results in the disturbance in excess of one (1) acre of total land area or which is part of a larger common area of development for sale. For projects with land disturbance less than a total acre of land or for projects with an Erosivity Waiver, the Contractor is not required to comply with the Stormwater Construction General Permit, but shall comply with similar standards for sediment erosion control and material and waste best management practices as detailed in the District's Water Pollution Control Program (WPCP).
- 4.6.5. The District is responsible for preparing a Stormwater Pollution Prevention Plan (SWPPP) and filing the Notice of Intent and fee to obtain coverage under the State Water Board Storm Water Construction General Permit for any project that disturbs one (1) acre or more which is not eligible for an Erosivity Waiver. A copy of the project SWPPP is provided by the District. A copy of the Storm Water Construction General Permit is provided by the District. Both the SWPPP and Storm Water Construction General Permit shall be kept on file at the construction site by the Contractor. The Contractor shall comply with both the project SWPPP and the Storm Water Construction General Permit without adjustment to the Contract Price or the Contract Time. The Contractor shall provide a designated individual meeting the specified qualifications and shall implement the SWPPP with regards to contract work items and shall timely and completely submit required reports and monitoring information required by the conditions of the Storm Water Construction General Permit and SWPPP for the Work. In addition to the compliance with the Storm Water Construction General Permit and SWPPP, the Contractor shall comply with all other applicable state, municipal or regional laws, ordinances, rules or regulations governing discharge of storm water, including applicable municipal storm water management programs. Contractor's Qualified SWPPP Practitioners (QSP) operating under the Construction General Permit shall meet the training requirements of the Construction General Permit and shall provide evidence of training to the District prior to start of construction.

- 4.6.6. The District is responsible for developing a Water Pollution Control Program (WPCP) for projects designated as disturbing less than 1 acre and for projects with Erosivity Waivers. The Contractor shall provide a designated individual with evidence of adequate training to implement the WPCP.

4.7. USE OF SITE AND CLEAN-UP

- 4.7.1. The Contractor shall confine operations at the Site to areas permitted by law, ordinances or permits, subject to any restrictions or limitations set forth in the Contract Documents. The Contractor shall not unreasonably encumber the Site or adjoining areas with materials or equipment. The Contractor shall be solely responsible for providing security at the Site with all such costs included in the Contract Price.
- 4.7.2. The District shall be providing CM and PI site supervision Monday through Friday from 7:00 AM to 3:30 PM. Working hours shall conform to local laws, which includes no street parking, deliveries, hoisting, welding, etc. or equipment startup. Scheduled and limited exceptions such as utility shutdowns and tie-ins to existing work shall be performed during "off-hours". All Work performed during off-hours must be coordinated and approved by the District, with a minimum of 48 hour notice. The Contractor is responsible for the costs of all overtime, shift time differentials, and other premium time costs required to achieve the schedule commitments. This includes, but is not limited to, work in excess of eight (8) hours per day, forty (40) hours per week, and/or work on Saturdays, Sundays and Holidays. If Contractor is behind schedule or not working full shifts in accordance with the hours indicated above, they shall be considered behind schedule and responsible for delay impacts.
- 4.7.3. The Contractor shall at all times keep the Site and all adjoining areas free from the accumulation of any waste material or rubbish caused or generated by performance of the Work. Contractor shall be aware of and take appropriate measure to avoid nuisances. Should the Project Inspector determine that any waste materials, rubbish, or other stored materials have become a nuisance; the Contractor will remedy the condition immediately upon oral and/or written notice. Contractor shall separately contain hazardous and unsanitary waste materials from other waste and mark each container appropriately and dispose of legally. Contractor shall maintain the Site in a "broom-clean" standard on a daily basis. Prior to completion of the Work, Contractor shall remove from the Site all rubbish, waste material, excess excavated material, tools, Construction Equipment, machinery, surplus material and any other items which are not the property of the District under the Contract Documents. If the Contractor fails to clean up as provided for in the Contract Documents, the District may do so, and all costs incurred in connection therewith shall be charged to the Contractor; the District may deduct such costs from any portion of the Contract Price then or thereafter due the Contractor.

4.8. ACCESS TO THE WORK

- 4.8.1. The Contractor shall provide DSA, the Project Inspector, Construction Manager, Project Manager, and the Architect with access to the Work at all times, whether in place, in preparation or in progress and wherever located. The Contractor shall also furnish the Project Inspector and the Architect access to the Work for obtaining such information as may be necessary to keep the Project Inspector and Architect fully informed respecting the progress, quality and character of the Work and materials, equipment or other items incorporated therein.

4.9. PATENTS AND ROYALTIES

- 4.9.1. The Contractor and the Surety shall defend, indemnify and hold harmless the District and its agents, employees and officers from any Claim, demand or legal proceeding arising out of or pertaining, in any manner, to any actual or Claimed infringement of patent rights or royalties therefrom in connection with performance of the Work under the Contract Documents.

4.10. CUTTING AND PATCHING

4.10.1. The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make the component parts thereof fit together properly in accordance with the Contract Documents.

4.11. EMPLOYEE FINGERPRINTING; STUDENT BARRIER/EMPLOYEE MONITORING

4.11.1. Pursuant to Education Code §§45125.1 and 45125.2, the Contractor shall implement the measures set forth in the Supplementary Conditions. The Contractor's implementation and maintenance of such measures is a material obligation of the Contract.

4.12. COMMUNICATIONS

4.12.1. All communications regarding the Work or the Contract Documents shall be in writing; verbal communications shall be reduced to writing and signed by both parties. Communications between the Contractor and the District shall be through the Architect. Communications between separate Contractors, if any, shall be through the Architect. All communications from the Contractor to the Architect will be copied to the Construction Manager. All written communications between the Contractor and any Subcontractor, Material Supplier or others directly or indirectly engaged by the Contractor to perform or provide any portion of the Work shall be available on the job site or online to the Architect and the Construction Manager for review, inspection and reproduction as may be requested from time to time. Failure or refusal of the Contractor to permit such review may be deemed a default of a material obligation of the Contractor.

4.13. ASSIGNMENT OF ANTITRUST CLAIMS

4.13.1. Pursuant to California Government Code §§4550, *et seq.*, the Contractor and its Subcontractor(s), of any tier, hereby offers and agrees to assign to the District all rights, title and interest in and to all causes of action they may have under Section 4 of the Clayton Act, (15 U.S.C. §15) or under the Cartwright Act (California Business and Professions Code §§16700 *et seq.*), arising from purchases of goods, services or materials hereunder or any Subcontract. This assignment shall be made and become effective at the time the District tenders Final Payment to the Contractor, without further acknowledgment by the parties.

4.13.2. If the District receives, either through judgment or settlement, a monetary recovery in connection with a cause of action assigned under California Government Code §§4550, *et seq.*, the assignor thereof shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the District any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the District as part of the Contract Price, less the expenses incurred by the District in obtaining that portion of the recovery. Upon demand in writing by the assignor, the District shall, within one year from such demand, reassign the cause of action assigned pursuant to this Article if the assignor has been or may have been injured by the violation of law for which the cause of action arose: and (i) the District has not been injured thereby; or (ii) the District declines to file a court action for the cause of action.

ARTICLE 5**5. SUBCONTRACTORS****5.1. SUBCONTRACTS**

- 5.1.1. Any portion of the Work performed for the Contractor by a Subcontractor shall be pursuant to a written Agreement between the Contractor and such Subcontractor which specifically incorporates by reference the Contract Documents and which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents, including without limitation, the policies of insurance required in the Supplementary Conditions and obligates the Subcontractor to assume toward the Contractor all the obligations and responsibilities of the Contractor which by the Contract Documents the Contractor assumes toward the District and the Architect. Specialty Subcontractors shall be utilized for the performance of such parts of the Work, which, under normal Contract practices, are performed by such Subcontractors unless the Contractor has customarily performed such Work, is equipped to do so, and the District in its reasonable discretion has agreed to same. The foregoing notwithstanding, no Contractual relationship shall exist, or be deemed to exist, between any Subcontractor and the District, unless the Contract is terminated and the District, in writing, elects to assume the Subcontractor.
- 5.1.2. Each Subcontract for a portion of the Work shall provide that such Subcontract may be assigned to the District if the Contract is terminated by the District pursuant to Article 16.3 or 16.4 hereof, subject to the prior rights of the Surety obligated under a bond relating to the Contract.
- 5.1.3. The Contractor shall, upon the District's request, and within ten (10) days of the request, provide to the District copies of all executed Subcontracts and Purchase Orders to which Contractor is a party. The Contractor's failure or refusal, for any reason, to provide copies of such Subcontracts or Purchase Orders shall be deemed Contractor's default in the performance of a material term of the Contract Documents.

5.2. SUBSTITUTION OF LISTED SUBCONTRACTOR

- 5.2.1. Any request of the Contractor to substitute a listed Subcontractor shall be considered only if such request is in strict conformity with this Article 5.2 and California Public Contract Code §4100 *et seq.* All costs incurred by the District, including without limitation, costs of the Construction Manager or Architect, in the review and evaluation of a request to substitute a listed Subcontractor shall be borne by the Contractor; such costs may be deducted by the District from the Contract Price then or thereafter due the Contractor.
- 5.2.2. Any request of the Contractor to substitute a listed DVBE or SDVOSB Subcontractor or supplier shall be considered only if such request is in strict conformity with this Article 5.2 and the substituted subcontractor is replaced with another DVBE /SDVOSB subcontractor or supplier. The District's Outreach Program, the Elite SDVOSB Network and the DVBE Alliance are available to assist Contractor in locating a qualified DVBE/SDVOSB of the same license classification if needed. In the event there is not another qualified DVBE/SDVOSB subcontractor or supplier to replace the DVBE/SDVOSB being substituted, or Contractor is unable to obtain bids from existing DVBE/SDVOSB subcontractors or suppliers, Contractor shall submit proof of contact and refusal to bid from the solicited DVBE/SDVOSB subcontractors or suppliers, as well as proof of contact and assistance request/receipt from the three referenced resources above. If District accepts the proof of contact and refusal then Contractor may substitute a non-DVBE/SDVOSB subcontractor or supplier to perform the work, subject District's approval. All costs incurred by the District, including without limitation, costs of the Construction Manager or Architect, in the review and evaluation of a request to substitute a listed Subcontractor shall be borne by the Contractor; such costs may be deducted by the District from the Contract Price then or thereafter due the Contractor.

- 5.2.3. The District's consent to Contractor's substitution of a listed Subcontractor shall not relieve Contractor from its obligation to complete the Work within the Contract Time and for the Contract Price. The substitution of a listed Subcontractor shall not, under any circumstance, result in, or give rise to any increase of the Contract Price or the Contract Time on account of such substitution.
- 5.2.4. In the event of the District's consent to the substitution of a listed Subcontractor, the Architect shall determine the extent to which, if any, revised or additional Submittals shall be required of the newly substituted Subcontractor. In the event that the Architect determines that revised or additional Submittals are required of the newly substituted Subcontractor, the Architect shall promptly notify the Contractor, in writing, of such requirement. In such event, revised or additional Submittals shall be submitted to Architect not later than thirty (30) days following the date of the Architect's written notice to the Contractor; provided that if in the reasonable and good faith judgment of the Architect, the progress of the Work or completion of the Work requires submission of additional or revised Submittals by the newly substituted Subcontractor in less than thirty (30) days, the Architect shall so state in its written notice to the Contractor.
- 5.2.5. In the event that the revised or additional Submittals are not submitted by Contractor within thirty (30) days, or such earlier time as determined by the Architect pursuant to the preceding sentence, following the Architect's written notice of the requirement for revised or additional Submittals, Contractor shall be subject to the per diem assessments reflected in Article 8.1.2 herein. Contractor shall reimburse the District for all fees and costs, including without limitation fees of the Architect or any design consultant to the Architect or the District and DSA fees, incurred or associated with the processing, review and evaluation of any revised or additional Submittals required pursuant to Article 5.2.4. *et seq.*; the District may deduct such fees and costs from any portion of the Contract Price then or thereafter due the Contractor.

ARTICLE 6**6. CONTRACT TIME****6.1. SUBSTANTIAL COMPLETION**

6.1.1. The Contract Time is the period of time, including authorized adjustments thereto, allotted in the Contract Documents for Substantial Completion of the Work. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing and achieving Substantial Completion of the Work for each phase, if any. The date for commencement of the Work is the date established by the Notice to Proceed issued by the District pursuant to the Agreement, which shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible. The date of Substantial Completion is the date certified by the Architect and the Project Inspector as such in accordance with the Contract Documents. Substantial Completion shall be determined by the Architect and the Project Inspector upon request by the Contractor in accordance with the Contract Documents. The good faith and reasonable determination of Substantial Completion by the Project Inspector and the Architect shall be controlling and final.

6.2. NO EARLY COMPLETION

6.2.1 By executing this Agreement, Contractor agrees that the Contract price includes all direct and indirect overhead costs (both home office and field office) throughout the Contract performance period, which ends on the Contract completion date specified in this Contract. By executing the Agreement, the Contractor acknowledges that it does not intend to complete the Contract earlier than said Contract completion date. Any intent by Contractor to complete the Contract earlier than said Contract completion date shall be void and of no force or effect, and Contractor shall not be entitled to claim additional compensation on the basis that it intended to, but was prevented from completing the project prior to the Contract completion date.

6.2.2 District shall not additionally compensate Contractor for early completion of the Work, unless agreed to in writing by the District and approved as an amendment to this Contract by the District's Board of Education. If the District accepts the Contractor's early completion schedule, the District reserves the right to execute a unilateral change order that amends the Contractual date of Substantial Completion and associated savings of overhead costs and General Conditions to coincide with the Contractor's anticipated Substantial completion date as depicted in such early completion schedule. The Contractor shall be subject to assessment of Liquidated Damages, as set forth in the Supplementary Conditions of the Contract and Article 6.7 of these General Conditions, if the Contractor fails to complete the Work and portions thereof within the Contract Time as adjusted by said unilateral change order.

6.3. CORRECTION OF DEFICIENCIES

6.3.1. Prior to the Contractor's request for determination of Substantial Completion by the Architect and the Project Inspector, the Contractor is required to issue its own comprehensive list of items of the Work to be corrected or completed by the Contractor ("Punchlist"). The Contractor must perform the corrective work and submit a signed-off copy of its own Punchlist to the Architect and the Project Inspector acknowledging Contractor's completion prior to requesting a determination of Substantial Completion. In the event the Contractor shall request determination of Substantial Completion or Final Completion by the Project Inspector and the Architect and it is determined by the Project Inspector and the Architect that the Work does not then justify certification of Substantial Completion or Final Completion and re-inspection is required at a subsequent time to make such determination, the Contractor shall be responsible for all costs of such reinspection,

including without limitation, the fees of the Architect and the salary of the Project Inspector. The District may deduct all such costs from the balance of the Contract Price then due or thereafter due to the Contractor.

- 6.3.2. Upon achieving Substantial Completion of all the Work or for each phase if any, the Project Inspector, the Architect, and the Contractor shall jointly inspect the Work and prepare a comprehensive Punchlist of the Work to be corrected or completed by the Contractor. The exclusion of, or failure to include, any item on such list shall not alter or limit the obligation of the Contractor to complete or correct any portion of the Work in accordance with the Contract Documents. Notwithstanding any other provisions of the Contract Documents to the contrary, inspection of the mechanical and electrical portions of the Work shall be conducted jointly by the Contractor's authorized representative(s), the Architect and the Project Inspector for the mechanical and electrical portions of the Work.
- 6.3.3. The Contractor shall promptly and diligently proceed to complete or correct all items noted on the Punchlist within thirty (30) days from the date the Contractor is in receipt of the Punchlist. In the event that the Contractor shall fail or refuse, for any reason, to complete items requiring completion or correction within the time so established, Contractor shall be subject to assessment of Liquidated Damages in accordance with Article 6.7 thereof. The foregoing notwithstanding, in the event of Contractor's failure or refusal to complete all items of the Work requiring correction or completion within the time so established, the District may, in its sole and exclusive discretion, elect to cause the completion of such items of the Work; provided, however, that such election by the District shall be in addition to, and not in lieu of, any other right or remedy of the District under the Contract Documents or the law. In the event that the District shall elect to complete items of the Work requiring correction or completion pursuant to the foregoing, Contractor shall be responsible for all costs incurred by the District in connection therewith.

6.4. FINAL COMPLETION

- 6.4.1 Final Completion is that stage of the Work when all Work has been completed in accordance with the Contract Documents, including without limitation, the performance of all correction or completion items noted upon Substantial Completion, and the Contract has been otherwise fully performed by the Contractor. Final Completion shall be determined by the Architect and the Project Inspector. The good faith and reasonable determination of Final Completion by the Project Inspector and the Architect shall be controlling and final. Final Completion of the Work shall not be deemed to have been achieved until: (a) all inspections have been completed; (b) Submittals, Guarantees, Record Drawings, Maintenance and Operations Manuals have been submitted and accepted; (c) all equipment shall be fully commissioned and operational as specified; and (d) the Work and adjoining areas of the Site are clean and ready for occupancy as an educational facility.
- 6.4.2 Final Acceptance of the Work shall occur upon approval of the Work by the District's Board of Education; such approval shall be submitted for adoption at the next regularly scheduled meeting of the District's Board of Education after the determination of Final Completion.

6.5. CONTRACT SCHEDULES

6.5.1. Execution

- 6.5.1.1. This section describes the scheduling of Work requirements to be performed by the Contractor. The term "Contract Schedules" refers to all schedules that are required herein and in the Specifications. The Contractor's planning, scheduling and execution of the Contract Work shall be presented to the Construction Manager by submission of the Contract Schedule information and data as described herein and in the Specifications. The Contractor shall plan, schedule, execute and report the Work under the Contract using a Critical Path Method

(CPM) schedule. The Contractor shall prepare the Contract Schedules to reflect the Contractor's proposed means and methods for accomplishing the entire scope of Work as awarded and included in the Contract Documents. The Contractor shall employ and supply a sufficient force of Workers, material and equipment, and shall prosecute the Work with such diligence so as to maintain progress, to prevent Work stoppage and to achieve Substantial Completion of all of the Work within the Contract Time. The Contractor shall not be entitled to, nor shall the District be required to make payment for any Contract Work until all Schedules comply with all Contract Requirements.

6.5.2. Baseline Schedule

- 6.5.2.1. The Baseline Schedule is defined as the Contractor's initial plan to conduct the Work, reviewed for acceptance by the Construction Manager in accordance with the Specifications. The Baseline Schedule shall show the breakdown of work into activities to the extent required to effectively plan the project, report work progress and analyze time impacts, and shall show all logical interrelationships (ties) between activities. The Baseline Schedule shall be the basis for monitoring the Contractor's progress, and the evaluation and reconciliation of Contract Time extensions. The Contractor shall prepare the Baseline Schedule based on the Contract as awarded, providing materials and equipment described in the Contract Documents, and without considering possible substitute or "or equal" items, even if the Contractor pursues a substitution in accordance with provisions of the Contract. The Construction Manager's final determination on proposed substitutions may not be made until after the Baseline Schedule or a Revised Schedule is submitted and accepted by the Construction Manager, or conditionally accepted with note exceptions.

6.5.3. Monthly Schedule Update

- 6.5.3.1. At monthly intervals, the Contractor shall update the schedule to reflect actual progress and submit the schedule update to the Construction Manager for review and acceptance in accordance with the Specification. The Monthly Schedule Update shall record progress for the period from the last Monthly Schedule Update through the current cutoff date set forth by the Construction Manager. The Monthly Schedule Update shall also forecast the remainder of the Work. The Monthly Schedule Update must not deviate significantly from the Baseline Schedule and shall not be used to delete or add activities, make title changes, and to make duration or logic changes. The Construction Manager may refuse to recommend the whole or part of any payment if, in the Construction Manager's opinion, the Contractor's failure, refusal or neglect to provide the required schedule information precludes a proper evaluation of whether or not the Contractor is prosecuting the work with the diligence that will ensure completion of the work within the Contract Time.

6.5.4. Schedule Corrections

- 6.5.4.1. Each month, in accordance with the Specification, the Contractor shall address corrections to the schedule that were identified by the Construction Manager during the review of the last Monthly Schedule Update. If the submittal is rejected, the Contractor must individually respond to every correction and review comment received from both the Construction Manager and/or Architect via the schedule narrative of the resubmittal. If the submittal is conditionally accepted with noted exceptions, the Contractor must individually respond to every correction and review comment via the schedule narrative of the next monthly update. Failure of the Contractor to specifically respond to each of the Construction Manager's previous review comments may result in rejection of the following submittal and a monthly payment portion withheld.

6.5.5. Look-Ahead Schedules

- 6.5.5.1. In accordance with the Specification, the Contractor shall submit a look ahead schedule that shows, at a level of detail satisfactory to the Construction Manager, the work planned and accomplished during the previous week and the upcoming work planned. The Contractor shall list the activity number from the Contract Schedule to which the activity on the look ahead schedule corresponds.

6.5.6. Schedule Revisions

- 6.5.6.1. Schedule Revisions are defined as any changes to schedule activities or logic other than the updating of actual start and completion dates, percent complete or remaining duration. The Contractor shall revise the Baseline Schedule when the Construction Manager determines that it is no longer useful as a status and control mechanism, when a change or delay impacts the Contractor's timing and sequence of the work, or when the Contractor has submitted logic changes that affect critical or near critical activities as determined by the Construction Manager. Schedule Revisions must be submitted in accordance with the Specification for the Construction Manager's review and acceptance. After the Construction Managers accepts the schedule revision, the Contractor shall incorporate the accepted revision into the next Monthly Schedule Update. Schedule Revisions are not to be used to change milestones dates of Contract Time.

6.5.7. Recovery Schedules

- 6.5.7.1. The Contractor's refusal, failure or neglect to take appropriate recovery action or to submit a Recovery Schedule shall constitute reasonable evidence that the Contractor is not prosecuting the Work with the diligence that will ensure its completion within the applicable Contract Time. Such lack of action shall constitute sufficient basis for the Construction Manager to withhold payments to the Contractor.

6.5.8 Contractor Responsibility Not Affected By Acceptance of Schedules

- 6.5.8.1. The Construction Manager's review or acceptance of the Contract Schedules shall not relieve the Contractor of its responsibility for scheduling, sequencing, and pursuing the Work to comply with the requirements of the Contract Documents, including adverse effects such as delays resulting from ill-timed Work or Work omitted from the schedule. Neither the submission nor the updating of any Contract Schedule Submittal shall have the effect of modifying the Contract Time, Contract Completion Date, Contract milestone dates, or the Contractor's obligations under this Contract. The Contractor shall be responsible for the coordination of Work activities performed by each Subcontractor and supplier, and to obtain information pertinent to the planning and updating of Subcontractor and supplier activities in preparing all Contract Schedules. The District reserves the right to review and comment on the Contract Schedules for conformance with the Contract Time and those sequences of Work indicated in or required by the Contract Documents, to record dates for milestones, for conformance with the scheduling requirements and other information provided in the Contract Documents that may have a bearing on the schedule, for reasonableness of durations and logic, and for consistency in the cost loading of the schedule activities. The Construction Manager's review shall not extend to the Contractor's means, methods, or techniques, the correctness of which shall remain the sole responsibility of the Contractor.

6.5.9. Cost of Schedule Preparation and Maintenance

- 6.5.9.1. The Contractor's responsibility for the preparation, Submittal and maintenance of the Contract Schedules is a material obligation under the Contract Documents. Any and all costs or expenses required or incurred to prepare, submit, maintain, and update the Contract Schedules shall be solely that of the Contractor and no such cost or expense shall be charged to the District. The Contract Price shall not be subject to adjustment on account of costs, fees or expenses incurred or associated with the Contractor's preparation, Submittal, and maintenance or updating of the Contract Schedules including adjustments required by change orders.

6.6. ADJUSTMENT OF CONTRACT TIME

6.6.1. Excusable, Noncompensable Delays

- 6.6.1.1. If Substantial Completion of the Work is delayed by Excusable Delays, the Contract Time shall be subject to adjustment for such reasonable period of time as determined by the Construction Manager and the District; Excusable Delays shall not result in any increase in the Contract Price. Excusable Delays refer to unforeseeable and unavoidable casualties or other unforeseen causes beyond the control, and without fault or neglect, of the Contractor, any Subcontractor, Material Supplier or other person directly or indirectly engaged by the Contractor in performance of any portion of the Work. Excusable Delays include, but are not limited to, unanticipated and unavoidable labor disputes, unusual and unanticipated delays in transportation of equipment, materials or Construction Equipment reasonably necessary for completion and proper execution of the Work, and unanticipated unusually severe weather conditions. Neither the financial resources of the Contractor or any person or entity directly or indirectly engaged by the Contractor in performance of any portion of the Work shall be deemed conditions beyond the control of the Contractor.
- 6.6.1.2. If an event of Excusable Delay occurs, the Contract Time shall be subject to adjustment hereunder only if the Contractor establishes: (i) full compliance with all applicable provisions of the Contract Documents relative to the method, manner and time for Contractor's notice and request for adjustment of the Contract Time; (ii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time are outside the reasonable control and without any fault or neglect of the Contractor or any person or entity directly or indirectly engaged by Contractor in performance of any portion of the Work; and (iii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time directly and adversely impacted Work activities on the Critical Path Time Impact Analysis requirements.

6.6.2. Compensable Delays

- 6.6.2.1. If Substantial Completion of the Work is delayed and such delay is caused by the acts or omissions of the District, the Architect, or separate Contractor employed by the District (collectively "Compensable Delays"), upon Contractor's request and notice, in strict conformity with Articles 6 and 10 of these General Conditions, the Contract Time shall be adjusted by Change Order for such reasonable period of time as determined by the Construction Manager and the District. In accordance with California Public Contract Code §7102, if the Contractor's progress is delayed by any of the events described in the preceding sentence, Contractor shall be entitled to the recovery of damages directly and proximately resulting therefrom, provided that the District is liable for the delay, the delay is unreasonable under the circumstances and was not within the reasonable contemplation of the District or the Contractor at the time of

execution of the Agreement. In such event, Contractor's damages, if any, shall be limited to direct, actual and unavoidable additional costs of labor, materials or Construction Equipment directly resulting from such delay, and shall exclude indirect Field office, indirect additional Home office, unabsorbed overhead, or other consequential damages. No adjustment of the Contract Time shall be made on account of any Compensable Delays unless such delay(s) actually and directly impact Work activities on the Critical Path Time Impact Analysis requirements.

6.6.3. Inexcusable Delays

- 6.6.3.1. Inexcusable Delays refer to any delay to the progress of the Work caused by events or factors other than those specifically identified in Articles 6.6.1 and 6.6.2 above. Neither the Contract Price nor the Contract Time shall be adjusted on account of Inexcusable Delays.

6.6.4. Notice of Delay

- 6.6.4.1. Failure of Contractor to request adjustment(s) of the Contract Time in strict conformity with applicable provisions of the Contract Documents shall be deemed Contractor's waiver of the same. Any delay, which will result in a request for an adjustment to the Contract Time, shall be documented by the Contractor in a letter to the Construction Manager within five (5) days of the occurrence. The Contractor shall identify the Contract Schedule activity number(s) and activity description(s) affected, as well as the event and documentation causing delay.

6.6.5. Concurrent Delays

- 6.6.5.1. If an Inexcusable Delay occurs concurrently with either an Excusable Delay or a Compensable Delay, the Contractor may not recover damages for the period of the concurrency under the provisions of Article 6.6.2, and the maximum extension of the Contract Time shall be equal to the Excusable Delay or the Compensable Delay.
- 6.6.5.2. Notwithstanding the foregoing, the District's failure to require compliance of any past delays shall not constitute a waiver or preclude it from enforcing such provisions in connection with any present or future delays.

6.6.6 Time Impact Analyses

- 6.6.6.1 If the Contractor experiences what they consider to be an excusable delay, the Contractor shall submit a written Time Impact Analysis (TIA) to the Construction Manager in accordance with the Specifications with each request for adjustment of Contract Time. Any accompanying cost proposal pursuant to Article 10 shall include all anticipated direct costs due to the delay, including direct actual extended General Conditions field overhead where applicable. If the Contractor does not submit a TIA for a specific change order or delay within the specified time as determined by the Construction Manager, the Contractor shall be deemed to have voluntarily irrevocably waived any rights to additional time and cost. In accordance with the Specifications the Contractor shall allow time for the Construction Manager to approve or reject the submitted TIA. The Contractor shall not incorporate any part of the Time Impact Analysis into the Monthly Schedule Update until authorized in writing by the Construction Manager.

6.7. LIQUIDATED DAMAGES

- 6.7.1. Should the Contractor neglect, fail or refuse to achieve Substantial Completion of the Work or phase thereof, within the Contract Time, as adjusted, the Contractor agrees to pay to

the District the amount of per diem Liquidated Damages set forth in the Supplementary Conditions, not as a penalty but as Liquidated Damages, for every day beyond the Contract Time, as adjusted, until Substantial Completion of the Work or phase thereof is achieved, subject to force majeure, as defined at Article 16.5 of the General Conditions. Contractor and District acknowledge and agree that if the Contractor fails to achieve Substantial Completion in accordance with the Contract Schedule, the District will incur costs and expenses not contemplated by the Contract Documents, the actual amount of which will be impracticable to ascertain. Contractor and District further acknowledge and agree that the per diem assessment set forth in the Supplementary Conditions represents a reasonable joint effort by the parties to establish an amount of Liquidated Damages that corresponds to actual loss and which is reasonable under the circumstances existing at the time the parties entered into the Contract. Liquidated Damages may be deducted from the Contract Price then or thereafter due the Contractor. The Contractor and the Surety shall be liable to the District for any Liquidated Damages exceeding any amount of the Contract Price then held or retained by the District. If the Contractor fails or refuses, for any reason, to promptly correct or complete all Punchlist items upon Substantial Completion for each phase within thirty (30) days as determined pursuant to Article 6.3 hereof, the Contractor shall be liable to the District for the per diem Liquidated Damages set forth in the Supplementary Conditions from the date that such items should have been corrected or completed until the date that all such items are actually corrected or completed. In the event the Contractor fails or refuses to correct or complete items of the Work noted upon Substantial Completion and the District elects to exercise its right to cause completion or correction of such items, the Contractor will be charged with the cost of completing or correcting the same.

ARTICLE 7**7. CONTRACT PRICE****7.1. SCHEDULE OF VALUES AND COST BREAKDOWN**

- 7.1.1. The Contractor shall prepare, on electronic spreadsheet forms, a detailed Schedule of Values comprising an estimate and complete Cost Breakdown of the Contract Price.
- 7.1.1.1. If the Contract requires a cost-loaded schedule per Specifications, the Schedule of Values shall be directly resulting from the cost-loaded schedule and the Contractor shall adhere to the requirements contained within Specifications. The Schedule of Values shall be submitted with the Baseline Critical Path Method (CPM) Schedule Submittal, and shall follow the same review and approval timeline as the Baseline CPM Schedule.
- 7.1.1.2. If the Contract does not require a cost-loaded schedule per Specifications, the Schedule of Values shall be sufficiently detailed and organized in a manner acceptable to the Construction Manager. The Schedule of Values shall be submitted to the Construction Manager, in both printed and electronic form, for review and approval within fifteen (15) days of the (NTP) date. Payment for uninstalled materials is limited to major pieces of equipment with a cost value in excess of \$10,000. The Construction Manager has ten (10) days to review the Schedule of Values Submittal. If the Construction Manager rejects the Schedule of Values, the Contractor has five (5) days after the date of the rejection to submit a revised Schedule of Values to the Construction Manager for review and approval. The foregoing procedure for the approval of the Schedule of Values shall continue until the District has accepted the entirety of the Schedule of Values.
- 7.1.1.3. If the Contract has multiple sites, Contractor is required to submit separate Schedule of Values per site.
- 7.1.1.4. The Schedule of Values shall be divided into costs in order to comply with the District's cost coding system.
- 7.1.2. Once the District accepts 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, except that the Contractor shall amend the Schedule of Values to separately list each change order upon District approval of said Change Order in accordance with the provisions of Article 10.5.
- 7.1.3. If the Contract requires a cost-loaded schedule per Specifications, upon District approval of a Change Order in accordance with the provisions of Article 10.5, the Contractor shall add separate cost-loaded activities to the Contract Schedule for each Change Order individually.
- 7.1.4. If the Contract does not require a cost-loaded schedule per Specifications, upon District approval of a Change Order in accordance with the provisions of Article 10.5, the Contractor shall amend the Cost Breakdown to separately list each approved change order.
- 7.1.5. If the Construction Manager so determines, the Contractor must further divide each Change Order as necessary to comply with the District's cost coding system.

7.2. PROGRESS PAYMENTS

- 7.2.1. During the Contractor's performance of the Work, the Contractor shall submit to the Construction Manager a CPM schedule update each month in accordance with the provisions of General Requirements. The CPM schedule update Submittal that is to be submitted to the Construction Manager after the Monthly Schedule Review Meeting shall include Applications for Progress Payments, on forms provided by the Construction Manager, setting forth an itemized estimate of Work completed in the preceding month for the purpose of the District's making of Progress Payments thereon. Values utilized in the Applications for Progress Payments shall be based upon the District accepted Cost Breakdown pursuant to Article 7.1 above and shall not be considered as fixing a basis for adjustments to the Contract Price.
- 7.2.1.1. Where the Contract requires a cost-loaded schedule per Specifications, the estimate of Work completed in the preceding month shall be directly determined by the cost-loaded Monthly Schedule Update. Refer to Specifications regarding Monthly Schedule Updates.
- 7.2.1.2. Where the Contract does not require a cost-loaded CPM schedule per Specification, the Contractor shall estimate the amount of the Application for Progress Payment by updating the status of each Schedule of Value item that is complete or in progress with a physical percent complete as of the last day of the preceding month or other cutoff date as approved or directed by the Construction Manager.
- 7.2.1.3. The Contractor shall submit the updated Schedule of Values, in both printed and electronic form, to the Construction Manager for review and approval. Monthly Schedule Review meetings shall be conducted in accordance with Specifications for the purpose of finalizing the percent to be paid for Work completed or in progress. After the meeting, the Contractor shall make revisions to the status of Schedule of Value line items, as directed by the Construction Manager, and submit the Application for Progress Payment and electronic Schedule of Values on the due date set forth herein. The Contractor must submit the Monthly Schedule Update package to the Construction Manager before the District will process an Application for Progress Payment for a given month.
- 7.2.2. In accordance with Public Contract Code §20104.50, upon receipt of an Application for Progress Payment, the District shall review the same for approval. Such Application shall be deemed "proper" for payment only if it is submitted on the appropriate District form fully completed and accompanied by: (i) Certified Payrolls of the Contractor and all Subcontractors, of any tier, for laborers performing any portion of the Work for which a Progress Payment is requested; (ii) if applicable, duly completed and executed forms of Conditional and Unconditional Waiver(s) and Release(s) of Rights Upon Progress Payment in accordance with California Civil Code §8132 covering the Progress Payment requested; (iii) if applicable, a current union statement reflecting that the Contractor and any Subcontractor of any tier, are current in the payment of any supplemental fringe benefits required pursuant to any collective bargaining Agreement to which the Contractor or any such Subcontractor is a party to or is otherwise bound by; (iv) a certification by the Contractor that it has continuously maintained, or caused to be maintained, the Record Drawings reflecting the actual as-built conditions of the Work performed for which the Progress Payment is requested, it being understood that such certification is subject to verification by the District; (v) the Construction Progress Schedule, (vi) daily construction reports, (vii) when appropriate, (a) completed and signed-off punch lists; (b) health and safety reports; and (c) test/adjust/balance records; (viii) signatures of the Project Inspector, Construction Manager, and the Architect; (ix) Updated List of Employees for both Contractor and all of his Subcontractors (Exhibit "C") with their DOJ fingerprinting status. In accordance with Public Contract Code §20104.50, an Application for Progress Payment

determined by the District not to be proper shall be returned by the District to the Contractor not more than seven (7) days after the District's receipt thereof setting forth, in writing, the reason(s) for the return.

- 7.2.3. Upon receipt of an Application for Progress Payment, the Architect and the Project Inspector shall inspect and verify the Work to determine whether it has been performed in accordance with the terms of the Contract Documents and to determine the portion of the Application for Progress Payment which is properly due to the Contractor under the terms of the Contract Documents.
- 7.2.4. In accordance with Public Contract Code §20104.50, within thirty (30) days after the District's receipt of a proper Application for Progress Payment, the District shall pay Contractor undisputed amounts. The District shall pay to Contractor a sum equal to ninety-five percent (95%) of the value of the Work indicated in the Application for Progress Payment, which is actually in place as of the date of the Application for Progress Payment. The remaining five percent (5%) shall be retained by the District until Final Completion. If an Application for Progress Payment is determined not to be proper due to the failure or refusal of the Contractor to submit documents or the submitted documents are incomplete or inaccurate, or if it is reasonably determined that the Record Drawings have not been continuously maintained to reflect the actual as-built conditions of the Work completed in the period for which the Progress Payment is requested, the 30-day period hereunder shall be deemed to commence on the date that the District is actually in receipt of all corrected documents or the date upon which the Contractor accurately and fully completes preparation of the Record Drawings relating to the Work for which the Progress Payment is requested.
- 7.2.5. Subject to the limitations of California Public Contract Code §9203, the District may, in its sole and exclusive discretion, disburse any remaining Progress Payments in full for Work actually in place at any time after fifty percent (50%) of the Work is concluded on Projects exceeding the amount of \$5,000, if the District determines that acceptable progress is being made.
- 7.2.6. In accordance with Public Contract Code §20104.50, in the event that the District fails to make any Progress Payment within thirty (30) days after receipt of a properly submitted Application for Progress Payment, the District shall pay the Contractor interest on the undisputed amount equal to the legal rate of interest set forth in California Code of Civil Procedure §685.010(a). The foregoing notwithstanding, if the District does not return an improper Application for Progress Payment within the allowed seven (7) day period provided in Article 7.2.2, the period of time for the District's disbursement of the Progress Payment without incurring the interest liability shall be reduced by the number of days exceeding the seven (7) day return period.
- 7.2.7. The approval of any Application for Progress Payment or the disbursement of any Progress Payment to the Contractor shall not be deemed nor constitute acceptance of defective Work or Work not in conformity with the Contract Documents.
- 7.2.8. The Contractor's Applications for Progress Payment may include requests for payment on account of Changes in the Work which have been properly authorized and approved by the District's Project Inspector, the Architect and all other governmental agencies with jurisdiction over such Change in accordance with the terms of the Contract Documents and for which a Change Order has been issued. Change Orders must be clearly identified and referenced on the itemization sheet submitted with the Contractor's Application for Progress Payment. Change Orders must be itemized in conformance with the Contractor's accepted Cost Breakdown. Except as provided for herein, the District shall make no other payment for Changes in the Work.
- 7.2.9. Except as expressly provided for herein, no payments shall be made by the District on account of any item of the Work, including without limitation, materials or equipment which,

at the time of the Contractor's Submittal of an Application for Progress Payment, have not been incorporated into and made a part of the Work.

- 7.2.10. The District may, in its sole and exclusive discretion, approve a request for payment not to exceed eighty percent (80%) submitted with an Application for Progress Payment for materials or equipment not yet incorporated into the Work if all of the following are complied with: (a) the materials or equipment have been delivered to the Site; (b) arrangements satisfactory to the District have been made by the Contractor to store and protect such materials or equipment at the Site including without limitation, insurance satisfactory to the District, covering and protecting against the risk of loss, destruction, theft or other damage to such materials or equipment while in storage; and (c) the establishment of procedures satisfactory to the District by which title to such materials or equipment shall be vested in the District upon the District's payment therefore. In the event that the District shall elect to make payment for materials or equipment delivered and stored at the Site, the costs and expenses incurred to comply with the requirements of (b) and (c) of this Article 7.2.11 shall be borne solely and exclusively by the Contractor.
- 7.2.11. The foregoing notwithstanding, the District may, in its sole and exclusive discretion, elect to make payment not to exceed eighty percent (80%) for materials or equipment not incorporated into the Work and which are not delivered or stored at the Site at or prior to the time of the Contractor's Submittal of an Application for Progress Payment. Contractor shall incorporate with the Application a request for payment of such materials or equipment and comply with all of the following requirements: (a) arrangements satisfactory to the District have been made by the Contractor to store and protect such materials or equipment at a secure warehouse/storage that is insured for up to 100% of the value of the materials or equipment not yet incorporated into the Work, which is agreed to in writing by the District, and which arrangements shall include without limitation, insurance satisfactory to the District, covering and protecting against the risk of loss, destruction, theft or other damage to such materials or equipment while in storage; and (b) the establishment of procedures satisfactory to the District by which title to such materials or equipment shall be vested in the District upon the District's payment therefore. The Contractor acknowledges that the discretion to make, or not to make, payment for such materials or equipment delivered or stored at a secure warehouse/storage that is insured for up to 100% of the value of the materials or equipment not yet incorporated into the Work pursuant to the preceding sentence shall be exercised exclusively by the District; the District's exercise of discretion not to make payment for such materials or equipment shall not be deemed the District's default hereunder. In the event that the District shall elect to make payment for materials or equipment delivered and stored at a secure warehouse/storage that is insured for up to 100% of the value of the materials or equipment not yet incorporated into the Work the costs and expenses incurred to comply with the requirements of (a) and (b) of this Article 7.2.12 shall be borne solely and exclusively by the Contractor and no payment shall be made by the District on account of such costs and expenses. All stored items shall be stored, inventoried and if applicable, specified by identification numbers; otherwise, all risk of loss remains with the Contractor.
- 7.2.12. The provisions of this Article 7.2 notwithstanding, the District shall not make any payment on account of any materials or equipment which is in the process of being fabricated or which are in transit to the Site or other storage location.
- 7.2.13. Neither the Contractor's Application for Progress Payment shall include, nor shall the District be obligated to disburse, any portion of the Contract Price for amounts which the Contractor does not intend to pay any Subcontractor, of any tier, or Material Supplier because of a dispute or any other reason.

7.3. TITLE TO WORK

- 7.3.1. The Contractor warrants that title to all Work covered by an Application for Progress Payment shall pass to the District no later than the time of payment. The Contractor further

warrants that upon Submittal of an Application for Progress Payment, all Work for which a Progress Payment has been previously issued and the Contractor has received payment from the District therefore shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, Claims, stop payment notices, security interests or encumbrances in favor of the Contractor, Subcontractors, Material Suppliers or other persons or entities making a Claim by reason of having provided labor, materials and equipment relating to the Work.

7.4. FINAL PAYMENT

- 7.4.1. When the Contractor has achieved Final Completion of the Work and has otherwise fully performed its obligations under the Contract Documents, the Contractor shall submit an application for final payment. Thereupon, the Architect and the Project Inspector shall promptly make a final inspection of the Work and when the Architect and the Project Inspector find the Work acceptable under the Contract Documents and that the Contract has been fully performed by the Contractor, the Architect and the Project Inspector shall thereupon promptly approve the Application for Payment, stating that to the best of their knowledge, information and belief, the Work has been completed in accordance with the terms of the Contract Documents. The final payment shall include the remaining balance of the Contract Price and any retention from Progress Payments previously withheld by the District for occupied, utilized, partially completed and accepted portions of the Work.
- 7.4.2. Neither the Final Payment nor any remaining Contract Price shall become due until the Contractor submits to the District each and all of the following (i) a certificate evidencing that insurance required by the Contract Documents to remain in force after the Contractor's receipt of Final Payment is currently in effect and shall be held for two (2) years from the final approval date set by the District; (ii) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover any period following Final Payment as required by the Contract Documents; (iii) duly completed and executed forms of Conditional or Unconditional Waivers and Releases of rights upon Final Payment of the Contractor in accordance with California Civil Code §8132, with each of the same stating that there are, or shall be, no Claims for additional compensation after disbursement of the Final Payment; (iv) Operations and Maintenance manuals and separate warranties provided by any Manufacturer or Distributor of any materials or equipment incorporated into the Work; (v) the Record Drawings; (vi) the form of Guarantee included in the Contract Documents duly executed by an authorized representative of the Contractor; (vii) Training and Orientation videos required by the Contract Documents; (viii) all equipment, fully commissioned and operating as specified; (ix) any and all other items or documents required by the Contract Document including **Exhibit C** of the General Conditions Final Project Completion Subcontractor's List as required by Labor Code §1773.3 (d) to be delivered to the District upon completion of the Work; and (x) if required by the District, such other data establishing payment or satisfaction of obligations such as receipts, releases and waivers of liens, stop payment notices, Claims, security interest or encumbrances arising out of the Contract to the extent and in such form as may be required by the District.
- 7.4.3. Not later than sixty (60) days following Final Acceptance, the District shall disburse the Final Payment to the Contractor. Pursuant to California Public Contract Code §7107, if there is any dispute between the District and the Contractor at the time that disbursement of the Final Payment is due, the District may withhold from disbursement of the Final Payment an amount not to exceed one hundred fifty percent (150%) of the amount in dispute. Any dispute regarding the District's alleged failure to comply with this section or with Public Contract Code §7107 shall be subject to the claims resolution procedures set forth in Article 18 of this Agreement.

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

7.5. WITHHOLDING OF PAYMENTS

- 7.5.1. The District may withhold any Progress Payment or the Final Payment, in whole or in part, or backcharge the Contractor to the extent it may deem advisable to protect the District on account of: (i) defective Work or Work not in conformity with the requirements of the Contract Documents which is not remedied; (ii) failure of the Contractor to make payments when due to Subcontractors or Material Suppliers for materials or labor; (iii) Claims filed or reasonable evidence of the probable filing of Claims by Subcontractors, laborers, Material Suppliers, or others performing any portion of the Work under the Contract Documents for which the District may be liable or responsible including, without limitation, Stop payment notice Claims filed with the District pursuant to California Civil Code §9000, *et seq.*; (iv) a reasonable doubt that the Contract can be completed for the then unpaid balance of the Contract Price; (v) tax demands filed in accordance with California Government Code §12419.4; (vi) other Claims, penalties and/or forfeitures for which the District is required or authorized to retain funds otherwise due the Contractor; (vii) any amounts due from the Contractor to the District under the terms of the Contract Documents; or (viii) the Contractor's failure to perform any of its obligations under the Contract Documents, including performance of any lawful or proper direction given by the District or public authority having jurisdiction over the Work or its default under the Contract Documents or its failure to maintain adequate progress of the Work. When the District is reasonably satisfied that the Contractor has remedied any such deficiency, payment shall be made of the amount withheld.

7.6. SUBSTITUTE SECURITY FOR RETENTION

- 7.6.1. Eligible and equivalent securities may be substituted for any monies withheld by the District to ensure the Contractor's performance under the Contract Documents at the request and expense of the Contractor and in conformity with the provisions of California Public Contract Code §10263. The foregoing and the provisions of California Public Contract Code §10263 notwithstanding, failure of the Contractor to request the substitution of eligible and equivalent securities for monies to be withheld by the District within ten (10) days following award of the Contract to Contractor shall be deemed a waiver of such right.

7.7. PAYMENTS TO SUBCONTRACTORS

- 7.7.1. The Contractor shall pay all Subcontractors for and on account of Work of the Contract performed by such Subcontractors in accordance with the terms of their respective Subcontracts and as provided for pursuant to California Public Contract Code §§10262 and 10253, the provisions of which are deemed incorporated herein by this reference.

ARTICLE 8**8. SUBMITTALS****8.1. SUBMITTALS**

- 8.1.1. Shop Drawings, Product Data, Samples and similar Submittals (collectively "Submittals") are not Contract Documents. The purpose for submission of Submittals is to demonstrate, for those portions of the Work for which Submittals are required, the manner in which the Contractor proposes to provide or incorporate such item of the Work in conformity with the information given and the design concept expressed in the Contract Documents.
- 8.1.2. The Contractor shall review, approve and submit to the Architect or such other person or entity designated by the District, the number of copies of Submittals required by the Contract Documents. Contractor's submission of Submittals in conformity with the Submittal Schedule is a material obligation of the Contractor under the Contract Documents. In the event of Contractor's failure or refusal to deliver Submittals to the Architect in accordance with the Submittal Schedule, the Contractor shall be subject to per diem assessments in the amount set forth in the Supplementary Conditions for each day of delayed submission for any Submittal beyond the date set forth in the Submittal Schedule, not as a penalty but as Liquidated Damages.
- 8.1.3. Contractor and District acknowledge and agree that if the Contractor fails to deliver Submittals in accordance with the Submittal Schedule, the District will incur costs and expenses not contemplated by the Contract Documents, the actual amount of which will be impracticable to ascertain. Contractor and District further acknowledge and agree that the per diem assessment set forth in the Supplementary Conditions represents a reasonable joint effort by the parties to establish an amount of Liquidated Damages that corresponds to actual loss and which is reasonable under the circumstances existing at the time the parties entered into the Contract.
- 8.1.4. In the event that the District or the Architect reasonably determines that all or any portion of such Submittals require re-submission, Contractor shall bear all costs associated with the review and approval of resubmitted Submittals, including without limitation Architect's fees incurred in connection therewith; such costs are in addition to, and not in lieu of, any per diem assessments. Submittals not required by the Contract Documents or which do not otherwise conform to the requirements of the Contract Documents may be returned without action. No adjustment to the Contract Time or the Contract Price shall be granted to the Contractor on account of its failure to timely submit any Submittal.
- 8.1.5. All Submittals prepared by Subcontractors, of any tier, Material Suppliers, Manufacturers or Distributors shall bear the written approval of the Contractor thereto prior to submission to the Architect for review. Any Submittal not bearing the Contractor's written approval shall be subject to return to the Contractor for Re-Submittal in conformity herewith, with the same being deemed to not have been submitted. Any delay, impact or cost associated therewith shall be the sole and exclusive responsibility of the Contractor without adjustment to the Contract Time or the Contract Price.
- 8.1.6. By approving and submission of Submittals, the Contractor represents to the District and Architect that the Contractor has determined and verified materials, field measurements, field construction criteria, catalog numbers and similar data related thereto and has checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents.
- 8.1.7. All Submittals shall be accompanied by a written transmittal or other writing by the Contractor providing an identification of the portion of the Drawings or the Specifications pertaining to the Submittal, with each Submittal numbered consecutively for ease of reference along with the following information: (i) date of submission; (ii) Project name; (iii) name of submitting Subcontractor; and (iv) if applicable, the revision number. The

foregoing information is in addition to, and not in lieu of, any other information required for the Architect's review, evaluation and approval of the Contractor's Submittals.

- 8.1.8. The Contractor shall not be relieved of responsibility for correcting deviations from the requirements of the Contract Documents by the Architect's review and acceptance of Submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission of the Submittal and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the Architect's acceptance thereof.
- 8.1.9. The Contractor shall perform no portion of the Work requiring the Architect's review and acceptance of Submittals until the Architect has completed its review and indicated acceptance of such Submittal. The Contractor shall not perform any portion of the Work forming a part of a Submittal or which is affected by a related Submittal until the entirety of the Submittal or other related Submittal has been fully accepted. Such Work shall be in accordance with accepted Submittals and other applicable portions of the Contract Documents.
- 8.1.10. The Architect shall review the Contractor's Submittals in compliance with the Contract Documents for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's approval of a specific item in a Submittal shall not indicate approval of an assembly of which the item is a component. The Architect's review of Submittals shall be conducted promptly so as not to delay or hinder the progress of the Work or the activities of the Contractor, the District or the District's separate Contractors while allowing sufficient time, in the Architect's reasonable professional judgment to permit adequate review of Submittals. If the Architect returns a Submittal as rejected or requiring correction(s) and re-submission, the Contractor, so as not to delay the progress of the Work, shall promptly thereafter resubmit a Submittal conforming with the requirements of the Contract Documents; the resubmitted Submittal shall indicate the portions thereof modified in order to obtain the Architect's acceptance. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Architect shall be entitled to rely upon the accuracy and completeness of such calculations and certifications accompanying Submittals.
- 8.1.11. If any portion of the Work is designated in the Contract Documents as a "Deferred Approval" item, Contractor shall be solely and exclusively responsible for the preparation of Submittals for such item(s) in a timely manner so as not to delay or hinder the completion of the Work within the Contract Time.

ARTICLE 9**9. MATERIALS AND EQUIPMENT****9.1. SPECIFIED MATERIALS, EQUIPMENT**

9.1.1. References in the Contract Documents to any specific Article, device, equipment, product, material, fixture, patented process, form, method or type of construction, by name, make, trade name, or catalog number, with or without the words "or equal" shall be deemed to establish a minimum standard of quality or performance and in conformance with the public interest.

9.1.2. References in the Contract Documents to any specific article, device, equipment, product, material, fixture, patented process, form, method or type of construction, by name, make, trade name or catalog number, with the wording "No Substitutions", shall be limited to the referenced item only.

9.2. APPROVAL OF SUBSTITUTIONS OR ALTERNATIVES

9.2.1. After issuance of Notice to proceed (NTP), the Contractor may propose to furnish equals, alternatives or substitutes for a particular item specified in the Contract Documents. Contractor's bid must be based on the specific article, device, equipment, product, material, fixture, patented process, form, method or type of construction identified in the specifications. "Or equals", alternatives or substitutions will be considered, after issuance of NTP, provided that the Contractor provides advance written notice to the Architect of such proposed substitution or alternative and certifies to the Architect and the District that the quality, performance capability and functionality (including visual and/or aesthetic effect) of the proposed alternative or substitute shall meet or exceed the quality, performance capability and functionality of the item or process specified and that the use of the substitution or alternative is appropriate and shall not delay completion of the Work or result in an increase to the Contract Price. The Contractor shall submit engineering, construction, dimension, visual, and aesthetic and performance data to the Architect to permit its proper evaluation of the proposed substitution or alternative on the District furnished Substitution Request Form.

9.2.2. If requested by the Architect, Contractor shall promptly furnish any additional information or data regarding a proposed substitution or alternative, which the Architect deems reasonably necessary for the evaluation of the proposed substitution or alternative. The Contractor shall not provide, furnish or install any substitution or alternative without the Architect's prior written approval of the same; any alternative or substitution installed or incorporated into the Work without first obtaining the District's approval of the same shall be subject to removal pursuant to Article 14 hereof. The District's decision shall be final regarding the approval or disapproval of the Contractor's proposed substitutions or alternatives. Neither the Contract Time nor the Contract Price shall be increased on account of any substitution or alternative proposed by the Contractor and which is approved by the District; provided, however, that in the event a substitution or alternative is approved by the Architect and purchase, fabrication and/or installation or such approved substitution or alternative shall be less expensive than the originally specified item, the Contract Price shall be reduced by the actual cost savings realized by the Contractor's furnishing and/or installation of such approved substitution or alternative.

9.2.3. The Contractor shall be solely responsible for all costs and fees of the Architect, of the Architect's consultant(s) and/or governmental agencies to review and/or approve any proposed substitution or alternative. The Contractor shall be solely responsible for any increase in the cost of any approved substitution or alternative or any Work affected by such alternative or substitution. All requests for the Architect's review and approval of any proposed substitution or alternative and all engineering, construction, dimension and performance data substantiating the equivalency of the proposed substitution or alternative

shall be submitted by Contractor on the District Substitution Request Form. Submission of substitution requests is allowed during the period indicated in the Specifications.

- 9.2.4. The Architect may reject, without review, any request for approval of proposed alternatives or substitutions not submitted within the time limitations indicated in the Specifications. The foregoing process and time limits shall apply to any proposed substitution or alternative regardless of whether the substitute or alternate item is to be provided, furnished or installed by Contractor, any Subcontractor, any Sub-Subcontractor, Material Supplier or Manufacturer. Any request for substitution of specified materials or equipment will be considered only if submitted on the District Substitution Request Form.

9.3. PLACEMENT OF MATERIALS AND EQUIPMENT ORDERS

- 9.3.1. Contractor shall, after award of the Contract, promptly and timely place all orders for materials and/or equipment necessary for completion of the Work so that delivery of the same shall be made without delay or interruption to the timely completion of the Work. Contractor shall require that any Subcontractor or Sub-Subcontractor performing any portion of the Work similarly place orders for all materials and/or equipment to be furnished by any such Subcontractor or Sub-Subcontractor in a prompt and timely manner so that delivery of the same shall be made without delay or interruption to the timely completion of the Work. Upon request of the Architect or the District, the Contractor shall furnish written evidence of the placement of orders for materials and/or equipment necessary for completion of the Work, including without limitation, orders for materials and/or equipment to be provided, furnished or installed by any Subcontractor or Sub-Subcontractor.
- 9.3.2. In the event the Contractor fails or refuses to comply with the requirements set forth in Article 9.3.1, above, the District shall have the right, but not the obligation, to place such orders on behalf of the Contractor. The election of the District to exercise, or not to exercise, such right shall not relieve the Contractor from any of Contractor's obligations under the Contract Documents, including without limitation, completion of the Work within the Contract Time and for the Contract Price. If the District exercises the right hereunder to place orders for materials and/or equipment on behalf of Contractor pursuant to the foregoing, Contractor shall reimburse the District for all costs and fees incurred by the District in placing such orders; such costs and fees may be deducted by the District from any portion of the Contract Price then or thereafter due the Contractor.

9.4. DELIVERIES OF MATERIALS AND EQUIPMENT TO THE SITE

- 9.4.1. All materials or equipment to be incorporated into the Work shall be designated on the Drawings and delivered to the designated staging or storage area at the Site utilizing delivery route(s) designated in the Drawings and/or as directed from time-to-time by the Project Inspector or Construction Manager. Promptly upon delivery of materials/equipment for incorporation into the Work, the Contractor shall provide the District's Project Inspector with copies of delivery slips, invoices, bills of lading and similar instruments that indicate the type, nature and quantity of the materials/equipment delivered. The Contractor is solely responsible for adequately protecting the designated delivery route(s) and improvements in, on or about the designated delivery route(s) without adjustment of the Contract Time or the Contract Price; the Contractor shall repair or replace all damage on or about the delivery route resulting from deliveries.

9.5. SALVAGE AND DISPOSAL OF EXISTING MATERIALS AND EQUIPMENT

- 9.5.1. All existing materials/equipment to be removed or disconnected and which have not been specifically designated in the Contract Documents for re-use in the Work, or for salvage by the District, shall become the property of the Contractor. All items designated for removal and deemed the property of the Contractor upon removal shall be disposed by the Contractor in conformity with applicable law, rule or regulation. The District shall have no liability for any materials or equipment once they are removed from the Site. The

Contractor shall not dispose of any such items at the Site by gift, sale or otherwise. If any existing materials/equipment or other existing improvements at the Site are to be removed, disconnected or relocated for re-use in connection with the Work, the removal, disconnection or relocation shall be completed in a manner to avoid damage or destruction of the Work or other existing improvements or facilities. Damage or destruction of the Work, any existing improvements, facilities or other items designated for re-use in connection with the Work shall be repaired or replaced by the Contractor without adjustment of the Contract Price or the Contract Time. Any damage or destruction of existing improvements, facilities, or other items caused by construction activities, or any activity by the Contractor shall be repaired, replaced, or corrected to return said item in kind with preconstruction status.

9.6. DISTRICT PROVIDED, CONTRACTOR INSTALLED PRODUCTS

- 9.6.1. The Provisions of this Article 9.6 apply only to materials, supplies, equipment, furnishings, or other things or property of any kind of type that will be paid for and provided by the District but incorporated into the Project or installed by the Contractor. The foregoing notwithstanding, the Contractor's responsibility related to materials, supplies, equipment, furnishings, or other things or property of any kind or type paid for and provided by the District and incorporated into the Project or installed by the District's own forces or by separate Contractors shall be as set forth in Article 11 hereof.
- 9.6.2. If the District provides any materials, supplies, equipment, furnishings, or other things or property of any kind or type for incorporation into the Project or installation by the Contractor, the Construction Manager will coordinate delivery dates of such items with the Contractor. The Contractor shall thereupon coordinate the delivery, incorporation, and installation of such items with the remainder of the Work and the Contract Schedule. District will arrange and pay for delivery of such items to the Project site. After delivery of such items to the Project site, the Construction Manager, Project Manager, Project Inspector, and Contractor will jointly inspect delivered items for damage. If such District provided items are damaged, defective, or missing, the District will arrange for their replacement.
- 9.6.3. For District provided and Contractor incorporated or installed products, the Contractor shall notify the Construction Manager of the required schedule for any Manufacturer's field services, and the Construction Manager will thereupon arrange for such Manufacturer's field services; the Contractor shall request the Construction Manager arrange for delivery of Manufacturer's warranties to the Contractor; and the Contractor shall request the Construction Manager arrange for and deliver to the Contractor appropriate shop Drawings, product data and samples. When and as received from the Construction Manager, the Contractor shall review such shop Drawings, product data, and samples and notify the Construction Manager, in writing, of any discrepancies or anticipated problems in incorporating or installing said products.
- 9.6.4. The Contractor is responsible for receiving, unloading, and handling at the Project site District provided and Contractor incorporated or installed items. The Contractor is responsible for protecting such District provided items from damage during storage and handling, including damage from exposure to the elements. If such District provided items are damaged as a result of the Contractor's operations, the Contractor shall promptly repair or replace them.
- 9.6.5. If the Contractor Claims that delay or additional cost is involved because the materials, supplies, equipment, furnishings, or other things or property of any kind or type provided by the District and to be incorporated or installed by the Contractor are not delivered to the Project site in accordance with the Contract Schedule and in an undamaged condition, the Contractor may seek an adjustment to the Contract Price or the Contract Time as provided for in the Contract Documents. Failure of the Contractor to request such an adjustment of

the Contract Time or the Contract Price in strict conformity with the provisions of the Contract Documents applicable thereto shall be deemed a waiver of the same.

ARTICLE 10**10. CHANGES****10.1. CHANGES IN THE WORK**

10.1.1. The District, at any time, by written order, may make Changes within the general scope of the Work under the Contract Documents or issue additional instructions; require additional Work or direct deletion of Work. The Contractor shall not proceed with any Change involving an increase or decrease in the Contract Price or the Contract Time without prior written authorization from the District via a Field Work Order or an approved Change Order.

10.1.2. The District's right to make Changes shall not invalidate the Contract nor relieve the Contractor of any liability or other obligations under the Contract Documents. Any requirement of notice of Changes in the scope of Work to the Surety shall be the responsibility of the Contractor, including any additional surety costs that may result from the adjustment of the Contract value. The Contractor can allow for these added costs through the Change Order provisions only. Changes to the Work depicted or described in the Drawings or the Specifications shall be subject to approval by DSA. The District may make Changes to bring the Work or the Project into compliance with environmental requirements or standards established by state or federal statutes and regulations enacted after award of the Contract.

10.2. ORAL ORDER OF CHANGE IN THE WORK

10.2.1. If the Contractor should Claim that any oral order, instruction, interpretation, determination, request, the Drawings, the Specifications, action, condition, omission, default, or other situation (collectively "Instructions") causes any change to the scope of the Work, or otherwise obligates the District to increase the Contract Price or to extend the Contract Time, the Contractor shall notify the Construction Manager and the Architect, in writing, of such Claim within five (5) days from the date of its actual or constructive notice of the factual basis supporting the same. The District shall consider any such Claim of the Contractor only if sufficient supporting documentation is submitted with the Contractor's notice to the Construction Manager and the Architect. The District, upon receipt from the Contractor, shall countersign such document.

10.2.2. Contractor acknowledges that its failure, for any reason, to give written notice (with sufficient supporting documentation to permit the District's review and evaluation) within five (5) days of its actual or constructive knowledge of any proposed adjustment of the Contract Time or the Contract Price shall be deemed Contractor's waiver, release, discharge and relinquishment of any right to assert or Claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of any such Instructions. In the event that the District determines that the Contract Price or the Contract Time are subject to adjustment based upon the events, circumstances and supporting documentation submitted with the Contractor's written notice, any such adjustment shall be determined in accordance with this Article 10.

10.3. WRITTEN ORDER OF CHANGE IN THE WORK

10.3.1. Within fifteen (15) days after receipt of a written request for cost estimate or written Field Work Order from the District directing a Change in the Work, or furnishing the written notice regarding any oral order directing a Change in the Work pursuant to paragraph 10.2 above, the Contractor shall submit to the Architect and the Construction Manager a detailed written statement setting forth the general nature of the Change, the amount claimed for any adjustment to the Contract Price on account thereof and the extent of adjustment of the Contract Time, if any, required by such Change. Said statement shall be properly itemized and supported by sufficient substantiating data to permit evaluation of the same, such documentation shall be submitted in conformance with the District form entitled "Payment – Extra, Additional, Allowances, Contingencies or Deleted Work" which is attached hereto

as Exhibit "A" and incorporated herein by reference. The Contractor may not reserve a right to assess impact costs, extended job site costs, extended general conditions overhead and any/or constructive acceleration costs at some later date as related to any and all changes of the Work. These Costs must be supported with full Schedule and Cost documentation with each proposed change within the Contract prescribed submission times. No Claim or adjustment to the Contract Price or the Contract Time shall be allowed if not asserted by the Contractor in strict conformity with this paragraph.

10.4. ADJUSTMENT TO CONTRACT PRICE AND CONTRACT TIME ON ACCOUNT OF CHANGES TO THE WORK

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

10.4.1.1. By negotiation and mutual Agreement, on a lump sum basis, between the District and the Contractor on the basis of the estimate of the actual costs and direct increase or decrease in costs on account of the Change. Upon request of the Construction Manager or the Architect, the Contractor shall provide a detailed estimate of increase or decrease in costs directly associated with performance of the Change along with Cost Breakdowns of the components of the Change and supporting data and documentation. The Contractor's estimate, if requested, shall be in sufficient detail and in such form as to allow the Construction Manager and the Architect to review and assess the completeness and accuracy thereof. The Contractor shall be solely responsible for any additional costs or additional time arising out of, or related in any manner to, its failure to provide the estimate of costs within the time specified in the request.

10.4.1.2. By the District based upon actual and necessary costs incurred by the Contractor as determined by the District on the basis of the Contractor's records. If the procedure set forth herein is utilized to determine the extent of adjustment to the Contract Price on account of Changes to the Work, promptly upon determining the extent of adjustment to the Contract Price the District shall notify the Contractor in writing of the same. The Contractor shall be deemed to have accepted the District's determination of the amount of adjustment to the Contract Price on account of a Change to the Work unless Contractor shall notify the District's Representative and the Architect, in writing, not more than fifteen (15) days from the date of the District's written notice, of any objection to the District's determination. Failure of the Contractor to timely notify the District's Representative and the Architect of Contractor's objections to the District's determination of the extent of adjustment to the Contract Price shall be deemed Contractor's acceptance of the District's determination and a waiver of any right or basis of the Contractor to thereafter protest or otherwise object to the District's determination. The District reserves the right to unilaterally execute changes to the contract if impasse is reached after a Good Faith Attempt to Resolve has failed to reach consensus. If the District makes a change unilaterally, the Contractor is referred to the Dispute Resolution clause herein.

10.4.1.3. If the Contractor was required to submit Bid Proposal prices for Unit Price Items identified in the Bid Proposal and a Change to the Work involves a Unit Price Item, the adjustment of the Contract Price for the portion of a Change involving a Unit Price Item shall be based upon the Unit Price proposed by the Contractor in its Bid Proposal for the applicable Unit Price Item. The foregoing notwithstanding, if at the time of a Change involving a Unit Price Item, the District reasonably determines that the price proposed for a Unit Price Item materially varies from the then existing marketplace costs for such item, the District shall not be bound by the price proposed for such Unit Price Item. In such event, the

adjustment of the Contract Price for a Change involving a Unit Price Item shall be the then existing marketplace costs for such item.

10.4.2. In the event of Changes in the Work resulting in an adjustment of the Contract Price and the adjustment of the Contract Price is based upon the methods set forth in Articles 10.4.1.2 and 10.4.1.3 above, the basis for adjustment of the Contract Price shall be as follows:

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

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

10.4.2.3. Contractor shall be compensated for the actual cost of the necessary and direct use of Construction Equipment in the performance of Changes to the Work. Use of such Construction Equipment in the performance of Changes to the Work shall be compensated in increments of fifteen (15) minutes. Rental time for Construction Equipment moved by its own power shall include time required to move such Construction Equipment to the site of the Work from the nearest available rental source of the same. If Construction Equipment is not moved to the Site by its own power, Contractor will be compensated for the loading and transportation costs in lieu of rental time. The foregoing notwithstanding, neither moving time or loading and transportation time shall be allowed if the Construction Equipment is used for performance of any portion of the Work other than Changes to the Work. Unless prior approval in writing is obtained by the Contractor from the Architect or the Construction Manager no costs or compensation shall be allowed for time while Construction Equipment is inoperative, idle or on standby, for any reason. The Contractor shall not be entitled to an allowance or any other compensation for Construction Equipment or tools under this paragraph where such Construction Equipment or tools have

a replacement value of Five Hundred Dollars (\$500) or less. Construction Equipment costs Claimed by the Contractor in connection with the performance of any Change to the Work shall not exceed rental rates established by Distributors or construction equipment rental agencies in the locality of the Site. Unless otherwise specifically approved in writing by the Architect or the Construction Manager, the allowable rate for the use of Construction Equipment in connection with Changes to the Work shall constitute full compensation to the Contractor for the cost of rental, fuel, power, oil, lubrication, supplies, necessary attachments, repairs or maintenance of any kind, depreciation, storage, insurance, labor (exclusive of labor costs of the Construction Equipment operator), and any or all other costs incurred by the Contractor incidental to the use of such Construction Equipment.

- 10.4.3. In determining the cost to the District and the extent of increase to the Contract Price resulting from a Change adding to the Work, the allowance for mark-ups on the costs of the Change for all overhead (including home office and field overhead for any period of delay caused by the Change in the Work) direct, indirect and consequential costs, general conditions costs and profit associated with the Change shall not exceed the percentage set forth in Exhibit "A," regardless of the number of Subcontractors, of any tier, performing any portion of any Change to the Work. The allowance for mark-ups includes all insurance costs, bonds, all field and home office staff and assistants, all on-site project administration, labor compliance, PSA, administration costs, site clean-up costs, security costs, warranty costs, as-built costs, scheduling costs, the cost of small tools and consumables, incidental job burdens and all general home office expenses. The risk of unanticipated price or cost fluctuations by a supplier of material or labor needed by a contractor is assumed by the Contractor. Any request for material cost adjustment relief caused by force majeure, as defined at Article 16.5 of the General Conditions, are at District's sole discretion.
- 10.4.4. The foregoing notwithstanding, in the event that the Means Construction Cost Data, or a mutually agreed to estimating manual in the event that Means Construction Cost Data shall cease publication, is utilized to determine the costs of only materials contained in a Change and the cost computation therein includes an allowance for overhead, general conditions costs and/or profit, the Contractor and any Subcontractor, of any tier, performing any portion of such Change, shall not be entitled to an allowance for overhead general conditions costs and/or profit beyond that reflected for such item of Change in the Means Construction Cost Data or other mutually agreed upon estimating manual.
- 10.4.5. In the event of a Change to the Work resulting in a reduction of the Contract Price, the District shall pay no profit or general conditions costs to the Contractor for the reduced or deleted Work. Costs for overhead related expenses related to the reduction of the Contract Price shall be addressed on a per-change basis. In such event, the adjustment to the Contract Price shall be the actual cost reduction realized by the reduced or deleted Work, plus profit and/or General Condition's costs. The profit and/or General Conditions costs that are added to the cost reduction shall not exceed the percentage set forth in Exhibit "A" for mark-ups on the cost of a Change adding to the scope of the Work.
- 10.4.6. In the event that Contractor shall be directed to perform any Changes to the Work pursuant to Article 10.1 or 10.2, or should the Contractor encounter conditions, which the Contractor, pursuant to Article 10.6, believes would obligate the District to adjust the Contract Price and/or the Contract Time; Contractor shall maintain detailed records on a daily basis. Such records shall include without limitation hourly records for labor and Construction Equipment and itemized records of materials and equipment used that day in connection with the performance of any Change to the Work. In the event that the Contractor performs more than one Change to the Work in a calendar day, Contractor shall maintain separate records for each such Change.

- 10.4.7. Contractor shall maintain detailed records on a time and material basis of Work required by Field Work Orders. Project Inspector review and signature is required for each daily time and material document.
- 10.4.8. In the event that any Subcontractor, of any tier, provides or performs any portion of any Change to the Work, Contractor shall require that each such Subcontractor maintain records in accordance with the requirements set forth herein. Each daily record maintained hereunder shall be signed by Contractor or Contractor's authorized representative; such signature shall be deemed Contractor's representation and warranty that all information contained therein is true, accurate, and complete and relate only to the Change referenced therein. All records maintained by a Subcontractor, of any tier, relating to the costs of a Change to the Work shall be signed by such Subcontractor's authorized representative.
- 10.4.9. All records maintained hereunder shall be subject to on-site inspection, review and/or reproduction by the Architect, Construction Manager, or the Project Inspector upon request. If the Contractor fails or refuses, for any reason, to maintain or make available for inspection, review and/or reproduction such records and the adjustment to the Contract Price on account of any Change to the Work is determined by the District, the District's reasonable good faith determination of the extent of adjustment to the Contract Price on account of such Change shall be final, conclusive, dispositive, and binding upon Contractor.
- 10.4.10. In the event of any Change(s) to the Work pursuant to this Article 10, the Contract Time shall be extended or reduced by Change Order pursuant to Article 6.4. In the event that any Change shall require an extension of the Contract Time, the Contractor shall not be subject to Liquidated Damages for such period of time. In the event that completion of the Work is delayed by causes for which the District is responsible, the Contractor shall be entitled to an adjustment pursuant to this Article 10.4 in the District's sole discretion.
- 10.4.11. Addition or deletion of an Alternate Bid Item(s) shall be in compliance with the procedures indicated in the Information to Bidders.

10.5. CHANGE ORDERS

- 10.5.1. If the District approves of a Change, a written Change Order by the District and prepared by the Construction Manager shall be forwarded to the Contractor describing the Change and setting forth the adjustment to the Contract Time and the Contract Price, if any, on account of such Change. All Change Orders shall be in full payment and final settlement of all Claims for direct, indirect and consequential costs, including without limitation, costs of delays or impacts related to, or arising out of, items covered and affected by the Change Order, including any and all overhead costs (both field and office) during any period of delay caused by the Change, as well as any adjustments to the Contract Time.
- 10.5.2. Any Claim or item relating to any Change incorporated into a Change Order not presented by the Contractor for inclusion in the Change Order shall be deemed waived. The Contractor waives and releases any and all claims, rights or interest, including but not limited to, those of cost, profit, acceleration, delay costs, interference, impact, disruption, loss of efficiency, ripple, or other extraordinary or consequential causes arising directly or indirectly out of the Work described in the Change Order except as specifically included within. The Contractor shall execute the Change Order prepared pursuant to the foregoing; once the Change Order has been prepared and forwarded to the Contractor for execution, without the prior approval of the District which may be granted or withheld in the sole and exclusive discretion of the District, the Contractor shall not modify or amend the form or content of such Change Order, or any portion thereof.
- 10.5.3. The Contractor's attempted or purported modification or amendment of any such Change Order, without the prior approval of the District, shall not be binding upon the District; any such unapproved modification or amendment to such Change Order shall be null, void and

unenforceable. Unless otherwise expressly provided for in the Contract Documents or in the Change Order, any Change Order issued hereunder shall be binding upon the District only upon action of the District's Board of Education approving and ratifying such Change Order.

- 10.5.4. In the event of any amendment or modification made by the Contractor to a Change Order for which there is no prior approval by the District, in accordance with the provisions of this Article 10.5, unless otherwise expressly stated in its approval and ratification of such Change Order, any action of the Board of Education to approve and ratify such Change Order shall be deemed to be limited to the Change Order as written by the Architect and prepared by the Construction Manager; approval and ratification of such Change Order shall not be deemed the District's approval and ratification of any unapproved amendment or modification by the Contractor to such Change Order.

10.6. DISPUTED CHANGES

- 10.6.1. Regardless of any dispute or disagreement between the Contractor and the District or the Architect regarding the characterization of any item as a Change to the Work or as to the appropriate adjustment of the Contract Price or the Contract Time on account thereof, the Contractor shall promptly commence and proceed diligently with the Change upon receipt of written authorization from District, in which case the dispute shall be subject to resolution in accordance with the claims procedures set forth in the Contract Documents.
- 10.6.2. In no event shall Contractor be entitled to stop the Work, or refuse to perform any Work required due to Changes in the Work, based upon a dispute between Contractor and the District regarding the amount to be paid to Contractor for any Change in the Work or the Adjustment of Time to be provided to account for such change.

10.7. EMERGENCIES

- 10.7.1. In an emergency affecting the safety of life, Work, or property, the Contractor, without special instruction or prior authorization from the District or the Architect, is permitted to act at its discretion to prevent such threatened loss or injury. Any compensation Claimed by the Contractor on account of such emergency Work shall be submitted and determined in accordance with this Article 10.

10.8. MINOR CHANGES IN THE WORK

- 10.8.1. The Architect may order minor Changes in the Work not involving an adjustment in the Contract Price or the Contract Time and not inconsistent with the intent of the Contract Documents. Such Changes shall be effected by written order via an Architect's Supplemental Instructions (ASI) and shall be binding on the District and the Contractor. The Contractor shall carry out such orders promptly.

10.9. UNAUTHORIZED CHANGES

- 10.9.1. Any Work beyond the lines and grades shown on the Contract Documents, or any extra Work performed or provided by the Contractor without notice to the Architect and the Construction Manager in the manner and within the time set forth in Article 10.2 shall be considered unauthorized and at the sole expense of the Contractor. Work so done shall not be measured or paid for, no extension to the Contract Time shall be granted on account thereof and any such Work may be ordered removed at the Contractor's sole cost and expense.

10.10. PRESERVATION OF RECORDS

- 10.10.1. The District shall have the right to examine and audit all daily job reports of Contractor's Project Manager(s), Project Superintendent(s) and/or Project foreperson(s), 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 are 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, available, after the time set forth above.

ARTICLE 11**11. SEPARATE CONTRACTS****11.1. DISTRICT'S RIGHT TO AWARD SEPARATE CONTRACTS**

11.1.1. The District reserves the right to perform construction or operations related to the Project with the District's own forces or to award separate contracts in connection with other portions of the Project or other construction or operations at or about the Site. If the Contractor Claims that delay or additional cost is involved because of such action by the District, the Contractor shall request an adjustment to the Contract Price or the Contract Time in accordance with the Contract Documents. Failure of the Contractor to request such an adjustment of the Contract Time or the Contract Price in strict conformity with the provisions of the Contract Documents applicable thereto shall be deemed a waiver of the same.

11.2. DISTRICT'S COORDINATION OF SEPARATE CONTRACTORS

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

11.3. MUTUAL RESPONSIBILITY

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

11.4. DISCREPANCIES OR DEFECTS

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

ARTICLE 12

12. PROTECTION OF PERSONS AND PROPERTY

12.1. GENERAL SAFETY

- 12.1.1. The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety programs required by applicable law, ordinance, regulation or governmental orders in connection with the performance of the Contract, or otherwise required by the type or nature of the Work. The Contractor's safety program shall include all actions and programs necessary for compliance with California or federal statutorily mandated Workplace safety programs, including without limitation, compliance with the California Drug Free Workplace Act of 1990 (California Government Code §§8350, *et seq.*) and the Cal/OSHA Construction Safety Standards. Without limiting or relieving the Contractor of its obligations hereunder, the Contractor shall require that its Subcontractors similarly initiate and maintain all appropriate or required safety programs.
- 12.1.2. The Contractor shall be solely responsible for initiating and maintaining reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to: (i) employees on the Work and other persons who may be affected thereby; (ii) the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-Subcontractors; and (iii) other property or items at the site of the Work, or adjacent thereto, such as classroom equipment, supplies, furnishings, trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall, at all times, maintain emergency first aid treatment materials at the Site that conform to applicable law, rule or regulation.
- 12.1.3. The Contractor shall have a written Safety Program acceptable to the District, which is formally communicated to, and fully understood by, all levels of the Contractor organization. The program must promote all of the following:
- Complete Management support of the program.
 - The immediate identification and elimination of unsafe Work practices and conditions in the Work place.
 - A heightened awareness of individual responsibility and increased supervisory attention to detail.
 - Building a team safety mentality where each Worker contributes to the effort and each supervisor is fully aware of the capabilities and limitations of their team.
 - A culture in which everyone accepts responsibility and accountability for their own, and each co-Worker's safety and health.
- 12.1.4. The Contractor shall erect and maintain, as required by existing conditions and conditions resulting from performance of the Contract, reasonable safeguards for safety and protection of property and persons, including, without limitation, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying District and users of adjacent sites and utilities. Each separate physical area where Work activities occur shall be enclosed or barricaded with a 9 ga. chain link fence of at least 8'-0" height with gates and knurled fabric at the top and bottom of the fencing with flat feet, or imbedded posts in asphalt or concrete. Barricades may need to be moved from time to time to accommodate Site needs; such moves shall be completed without adjustment of the Contract Time or the Contract Price. Solid board fencing shall be used in lieu of chain-link if shown on the plans. The Project Inspector shall determine final locations and types of fencing. If the Project Inspector requires fencing types and/or quantities not indicated in the Contract Documents, an appropriate change document will be negotiated. All Work shall be arranged as to minimize inconvenience or disruption of school activities and to minimize danger to students, faculty, staff and others at or about

the Site. Work, which may interfere with school activities, shall be done before or after school hours. All such enclosures or barricades shall provide adequate exiting from occupied structures at all times.

- 12.1.5. The Contractor shall give or post all notices required by applicable law and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss. No more than twenty-four (24) hours following: (i) any accident occurring at the Site involving any person performing Work and/or construction equipment; or (ii) any injury to any person at or about the Site, the Contractor shall submit a written Accident/Injury Report to the Construction Manager. The form of the Accident/Injury Report shall be as required by the District. An Accident/Injury Report shall be submitted for all accidents and injuries regardless of severity or whether an accident or injury constitutes a loss time accident. The timely submission of an Accident/ Injury Report with all required information accurately and completely provided is a material obligation of the Contractor.
- 12.1.6. The Contractor shall designate a responsible member of the Contractor's organization at the Site whose duty shall be the prevention of accidents and the implementation and maintenance of safety precautions and programs. The Contractor shall advise the Project Inspector and Construction Manager of the name of the designated safety coordinator in writing. The safety coordinator shall conduct safety meetings at least once a week with Contractor's employees, Subcontractors, and any tiers thereof. In addition, the Contractor shall provide the Construction Manager with a copy of a safety plan and copies of safety plans from each of Contractor's Subcontractors at the commencement of the Project.
- 12.1.7. In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss.
- 12.1.8. In the event that the District identifies a loss of property, the Contractor shall assist the District in the investigation of said loss and shall fill out the District's Property Damage and Loss Report as requested.

12.2. RESPONSIBILITIES

- 12.2.1. Unless otherwise notified, the Contractor shall submit to the District a written Environmental Safety and Health (ES&H) Execution Plan, specific to the Work under this contract, for review and acceptance within thirty (30) calendar days after contract award and in any event prior to commencing Work at the Jobsite. This plan shall be amended when operations or conditions require and such amendments shall be submitted to the District for review and acceptance.
- 12.2.2. The Contractor shall flow all Project safety and health requirements to lower tier suppliers, Subcontractors, and visitors and acknowledges it is responsible for the performance of its visitors and suppliers and Subcontractors of every tier.
- 12.2.3. The Contractor's ES&H Execution Plan shall delineate the roles and responsibilities of Managers and supervisors and require that their actions clearly demonstrate an understanding of their roles and responsibilities in regard to the safety and environmental protection processes. The plan shall describe the system by which Managers and supervisors will be held accountable for ES&H implementation.
- 12.2.4. The Contractor's ES&H Representative(s) and their staff shall have sufficient authority and control to ensure effectiveness of the ES&H process and the Contractor shall hold them accountable for facilitating its implementation.
- 12.2.5. The Contractor's Managers and supervisors shall be familiar with, and shall enforce ES&H rules, regulations, and laws, and shall document all actions taken to ensure compliance with Contractor's ES&H Execution Plan.

- 12.2.6. The Contractor's Managers and supervisors shall take part in scheduled Work area audits, and shall implement and document required corrective actions.
- 12.2.7. The Contractor's Site Management shall attend and clearly communicate ES&H expectations at all employee ES&H Orientations.
- 12.2.8. Unless otherwise directed by the District, the Contractor's Site Management, Managers, and supervisors shall participate in any scheduled, documented ES&H assessments to be conducted by Contractor or the District.
- 12.2.9. The Contractor's Managers and supervisors shall attend, actively participate in, and consistently demonstrate strong leadership at weekly "Tailgate" Safety Meetings.
- 12.2.10. The Contractor's Managers and supervisors shall actively participate in documented pre-job planning activities.
- 12.2.11. The Contractor's ES&H Representative shall actively participate in, and/or provide any needed, Specialized ES&H training, such as confined space, fire watch, Work from elevated platforms, etc. and keep the appropriate documentation.
- 12.2.12. The Contractor shall inform all its Project personnel of potential hazardous conditions and/or near miss incidents and shall document such communications.
- 12.2.13. Unless otherwise directed by the District, and before beginning any Work, the Contractor shall require all lower tier suppliers and Subcontractors to submit a written ES&H Plan specific to their scope of Work. The Contractor shall review and accept all such plans for compliance with District, and regulatory requirements.
- 12.2.14. The Contractor shall participate in any Work area audits performed by the District, and root cause investigations.
- 12.2.15. The Contractor's foremen shall complete, file on-site and make available to the District, weekly Tailgate Safety Meeting minutes.
- 12.2.16. The Contractor shall stop Work if unknown or unanticipated hazards or Work conditions evolve which place employees at risk or necessitate greater precautions than currently exist or are required in the Project ES&H Execution Plan. The Contractor shall immediately report all such incidents to the District.

12.3. ORIENTATION AND TRAINING

- 12.3.1. Contractor Management shall provide the support and resources necessary to ensure adequate and effective training is provided and documented. Supervisors shall ensure adequate time is provided for such training.
- 12.3.2. Before Contractor employees are placed on any Worksite, training shall be provided which satisfies regulatory requirements. A verification process (i.e., comprehension testing) may be required at the District's discretion.
- 12.3.3. The Contractor shall update training materials to reflect changes in applicable local state and federal laws, regulations or Project requirements.
- 12.3.4. The Contractor shall provide and require employees to attend sufficient specialized training applicable to their Work (e.g., confined space, Work at height, fire watch, etc).
- 12.3.5. All Contractor employees shall attend their company specific New Employee Orientation. Documentation of all training and comprehension testing shall be kept on file on-site and made available to the District.
- 12.3.6. The Contractor shall ensure that all Project visitors/vendors/delivery personnel are escorted at all times by an authorized and responsible Contractor employee who is

knowledgeable of all ES&H practices and procedures and instructs and supervises the visitor/vendor/delivery person accordingly.

12.4. MEDICAL SERVICES & MEDICAL TREATMENT

- 12.4.1. Contractor site personnel who provide first aid or other medical care shall be properly trained and qualified with a copy of their current certifications/licenses maintained on site.
- 12.4.2. The Contractor shall ensure its employees understand and comply with its medical management procedures.
- 12.4.3. The Contractor's ES&H Representative shall review all return-to-Work orders.
- 12.4.4. The Contractor emergency equipment shall be inspected daily to ensure effective operation. All such inspections shall be documented, kept on file on-site, and made available to the District.
- 12.4.5. Where applicable, the Contractor shall maintain clean and orderly first-aid facilities and locations where first aid treatment is provided.
- 12.4.6. The Contractor shall ensure injured employees are promptly referred to qualified industrial/occupational medical providers if offsite treatment is needed. The injured employee's employer shall provide transportation for such offsite medical treatment.
- 12.4.7. The Contractor employees injured on the Project and returned for modified duty shall have this status documented by the treating medical practitioner and reported to the District's Site Safety Supervisor or Site Manager.

12.5. MEDICAL REPORTING AND RECORDS

- 12.5.1. Contractor medical records shall be maintained up-to-date. Any recordable injuries are to be promptly reported to the District's Site Safety Supervisor or Site Manager. All other matters pertaining to medical records and reports shall be kept strictly confidential. The Contractor shall maintain and file its own Workers' compensation or insurance Claims forms as necessary.
- 12.5.2. The Contractor shall develop a method for tracking the status of injuries and shall be able to produce and provide to the District a Safety Performance Report with that information.

12.6. JOB HAZARD ANALYSIS

- 12.6.1. Unless otherwise directed by the District, the Contractor shall perform a Job Hazard Analysis (JHA) common to the construction industry for any Work of a hazardous nature. The JHA is generally in table form and simply describes tasks to be performed, potential hazards and mitigating measures. The JHA is used to identify, analyze, understand and mitigate potential hazards associated with repetitive or potentially hazardous Work operations.
- 12.6.2. Supervisors shall ensure that their employees understand the purpose of, and participate in the JHA and Tailgate meetings and shall use them as primary planning and lessons learned tools.

12.7. PERSONAL PROTECTIVE EQUIPMENT

- 12.7.1. Contractor shall require employees to wear eye protection at all times while working in the field. Safety glasses shall be equipped with hard side shields and should be manufactured to ANSI standard Z87.1. This applies to prescription eyewear as well. Contractor shall monitor the eye protection worn by its employees and take immediate corrective actions when non-compliance is noted. Employees performing grinding and buffing operations shall wear face shields and safety glasses or mono goggles.

- 12.7.2. Hardhats shall be worn with the brim forward at all times when in the field and shall be worn at all times when in direct proximity to construction operations.
- 12.7.3. Welders shall wear hardhat/welding hood combinations and safety glasses while welding. Welding screens shall be used to protect other employees from the hazards associated with direct welding arc rays.
- 12.7.4. Contractor employees with field responsibilities shall wear sturdy Work shoes or boots acceptable to the District.
- 12.7.5. Contractor employees shall receive information regarding personal protective equipment requirements during Contractor's New Employee Orientation.
- 12.7.6. Contractor employees who handle chemicals or harmful substances shall be trained in accordance with local, state and federal regulations, and shall wear appropriate personal protective equipment per the chemical Manufacturer's recommendations.
- 12.7.7. Contractor shall require all employees to wear long pants and a suitable shirt, with no less than 4" or 10 cm length sleeves, as the minimum Work clothing to be worn on the Project.
- 12.7.8. Contractor shall provide and require the use of appropriate hearing protection whenever a hearing hazard exists in accordance with local, state and federal regulations and or at the direction of the District.

12.8. RESPIRATORY PROTECTION

- 12.8.1. Contractor shall provide and require the use of appropriate respiratory protective equipment in accordance with 29 CFR 1910.134 and acceptable to the District, whenever a respiratory hazard exists.
- 12.8.2. A competent person knowledgeable of inhalation hazards and respiratory protective equipment shall be designated by the Contractor to conduct a step-by-step evaluation to insure that only respiratory protection appropriate for the conditions of exposure is selected and utilized.
- 12.8.3. Where respiratory protection is required or expected to be required, the Contractor shall have a written Respiratory Protection Program, which describes the selection, use, care and sanitation of respiratory equipment. This procedure shall include the name of the procedure administrator for the site, cartridge change out data, method to be used for sanitizing respirators, medical qualifications of those required to wear respirators, methods for fit testing and employee training.
- 12.8.4. Contractor supervisors shall notify the District's Site Safety Representative or Construction Manager before starting any Work that requires employees wear respiratory protection.

12.9. HEARING CONSERVATION PROGRAM

- 12.9.1. Contractor shall have a written Hearing Conservation Procedure. The procedure shall include information on noise surveys, engineering controls, the procurement and use of low noise equipment when possible, posting of signs and warnings for areas found to require hearing protection, and training on hearing protection devices used on the Project.

12.10. HAZARDOUS MATERIALS AND HAZARD COMMUNICATION

- 12.10.1. In the event that the Contractor, any Subcontractor or anyone employed directly or indirectly by them shall use, at the Site, or incorporate into the Work, any material or substance deemed to be hazardous or toxic under any law, rule, ordinance, regulation

or interpretation thereof (collectively "Hazardous Materials"), the Contractor shall comply with all laws, rules, ordinances or regulations applicable thereto and shall exercise all necessary safety precautions relating to the use, storage or disposal thereof.

- 12.10.2. Contractor shall develop a written Hazard Communication Plan and, as required, implementing procedures describing the method it will use to communicate the hazards associated with chemical handling, use, storage and disposal. The plan shall be consistent with the project SWPPP and submitted and acceptable to the District prior to start of Work.
- 12.10.3. Contractor shall make available to the District, Material Safety Data Sheets (MSDS) for each chemical substance purchased and/or carried onto a Worksite. Materials that arrive without an MSDS shall be quarantined and not released until the MSDS is received on site and the material is approved for use by the District. The Contractor shall maintain a list of hazardous materials on site and the quantities of each.
- 12.10.4. Contractor shall ensure that employees are trained (in accordance with local, state and federal regulations) in the recognition, proper handling and use of hazardous substances. Contractor's New Employee Orientation shall include introductory training on the topic of hazardous substances however; specific hazardous material training shall be provided by the Contractor for its Project employees whose Work involves the use of any hazardous material under its control. Such training shall be properly documented, filed and made available to the District. Contractor personnel shall be prohibited from participating in, or in the on-site supervision of, hazardous, toxic or radiological materials activities unless they have been certified as having successfully completed the training to a level required by their position, function and responsibilities.
- 12.10.5. Contractor shall properly label all hazardous substances and/or chemicals that have been transferred from the Manufacturer's container into another container. Inspections shall be made and documented by the Contractor to ensure that adequate labeling occurs.
- 12.10.6. Transportation, use, storage, and disposal of hazardous substances shall be under the supervision of a qualified person. Transportation, use and storage of hazardous substances shall be planned and controlled to prevent contamination of people, animals, food, water, equipment, materials and environment in accordance with local, state and federal regulations.
- 12.10.7. Disposal of surplus or excess materials and containers shall occur in a manner that will not contaminate or pollute any water supply, ground water, or streams, and will comply with the project SWPPP, federal, state and local regulations and guidelines.
- 12.10.8. In the event the Contractor encounters Hazardous Materials at the Site which have not been rendered harmless or for which there is no provision in the Contract Documents for containment, removal, abatement or handling of such Hazardous Materials, the Contractor shall immediately stop the Work in the affected area, but shall diligently proceed with the Work in all other unaffected areas. Upon encountering such Hazardous Materials, the Contractor shall immediately notify the Project Inspector and the Architect, in writing, of such condition. The Contractor shall proceed with the Work in such affected area only after such Hazardous Materials have been rendered harmless, contained, removed or abated. In the event such Hazardous Materials are encountered, the Contractor shall be entitled to an adjustment of the Contract Time to the extent that the Work is stopped and Substantial Completion of the Work is affected thereby. The District reserves the right to request the Contractor to de-mobilize and re-mobilize in the event unexpected Hazardous materials are encountered and alternate Work areas are not available. Upon the District's remediation of the Hazardous materials, the District will contact the Contractor and a re-mobilization date agreed to. If the District selects this scenario the Contractor shall be reimbursed only for the costs associated directly with

de-mobilization and re-mobilization and the Contract time extended accordingly. In no event shall there be an adjustment to the Contract Price solely on account of the Contractor encountering such Hazardous Materials.

- 12.10.9. Notwithstanding any provision of the Drawings or the Specifications to the contrary, it is the intent of the District that Asbestos Construction Building Materials ("ACBMs") not be used or incorporated into any portion of the Work. In the event that any portion of the Work depicted in the Drawings or the Specifications shall require materials or products which the Contractor knows, or should have known with reasonably diligent investigation, to contain ACBMs, Contractor shall promptly notify the Architect and the Project Inspector of the same so that an appropriate alternative can be selected in a timely manner so as not to delay the progress of the Work. Contractor warrants to the District that there are no materials or products used or incorporated into the Work, which contain ACBMs. Whether before or after completion of the Work, if it is discovered that any product or material forming a part of the Work or incorporated into the Work contains ACBMs, the Contractor shall at its sole cost and expense remove such product or material in accordance with any laws, rules, procedures and regulations applicable to the handling, removal and disposal of ACBMs and to replace such product or material with non-ACBM products or materials and to return the affected portion(s) of the Work to the finish condition depicted in the Drawings and Specifications relating to such portion(s) of the Work. Contractor's obligations under the preceding sentence shall survive the termination of the Contract, the warranty period provided under the Contract Documents, the Contractor's completion of the Work or the District's acceptance of the Work. In the event that the Contractor shall fail or refuse, for any reason, to commence the removal and replacement of any material or product containing ACBMs forming a part of, or incorporated into the Work, within ten (10) days of the date of the District's written notice to the Contractor of the existence of ACBM materials or products in the Work, the District may thereafter proceed to cause the removal and replacement of such materials or products in any manner which the District determines to be reasonably necessary and appropriate; all costs, expenses and fees, including without limitation fees and costs of consultants and attorneys, incurred by the District in connection with such removal and replacement shall be the responsibility of the Contractor and the Contractor's Performance Bond Surety.
- 12.10.10. Contractor, Subcontractor, or any tiers thereof, are prohibited from using any material or substance containing lead.
- 12.10.11. Contractor shall be solely and exclusively responsible for the disposal of any Hazardous Materials on or about the Contractor's Site. Contractor's obligations hereunder shall include without limitation, the transportation and disposal of any Hazardous Materials in strict conformity with any and all applicable laws, regulations, orders, procedures or ordinances.

12.11. TOOLS AND EQUIPMENT

- 12.11.1. Contractor shall provide and ensure that all tools are used in accordance with the Manufacturers' recommendations, have required guards in place, and are maintained in good Working order.
- 12.11.2. Contractor will ensure that excess flow valves are installed on air manifolds and compressors supplying air to >1/2 inch (or equivalent metric) ID hoses.
- 12.11.3. Contractor will not use job-made tools of any kind on the Project. All tools and equipment shall be used and maintained in accordance with Manufacturer recommendations. If exceptions to this rule are needed, they must be brought to the District's attention for review and acceptance prior to use.

- 12.11.4. Contractor shall only permit properly trained and certified employees to use powder-actuated tools. Documentation of the employees training shall be made available to the District and each employee using such tools shall carry qualification cards. Control shall be kept of the powder-actuated charges. Each cartridge shall be accounted for and properly stored. No live or spent cartridges shall be left on the ground or disposed of in Project trashcans or other unauthorized on or off-site container.
- 12.11.5. Contractor shall ensure that Work is performed only in areas and at times where adequate illumination exists. Contractor shall provide all lighting required to safely perform Work. Artificial lighting equipment shall be manufactured to a recognized standard acceptable to the District.

12.12. PEST CONTROL

- 12.12.1. The Contractor shall be solely responsible for initiating, maintaining and supervising all requirements of the State of California Healthy Schools Act of 2000, (Article 4, commencing with §17608, to Chapter 5 of Part 10.5 of the Education Code) and the Food and Agricultural Code relating to school safety (Article 17, commencing with §13180, to Chapter 2 of Division 7 of the Food and Agricultural Code), including without limitation:
- 12.12.2. The Contractor shall obtain from the District Integrated Pest Management Office the approved Pesticide list. The Contractor must use only the Pesticides on the list. If the Contractor wants to request a Pesticide that is not on the list, the Contractor is required to submit to the District the MSDS and the Label of Pesticide for consideration.
- 12.12.3. The Contractor shall obtain from the District Integrated Pest Management Office a list of those individuals who have requested notification of pesticide application. The Contractor shall notify 72 hours prior to a pesticide application, all staff and parents or guardians of students enrolled at a school, and those who have requested notification, of any pending pesticide application. This notice shall include the product name, the active ingredient or ingredients in the product, and the intended area and date of application.
- 12.12.4. The Contractor shall post each area of the site where pesticides will be applied with a warning sign. The warning sign shall prominently display the term "Warning - Pesticide Treated Area" and shall include the product name, Manufacturer's name, the United States Environmental Protection Agency's product registration number, intended date of application, areas of application, and reason for the pesticide application. The warning sign shall be visible to all persons entering the treated area and shall be posted twenty-four (24) hours prior to the application and remain posted until seventy-two (72) hours after the application. The Contractor shall be responsible for removing the posted signs in a timely manner after the seventy-two (72) hour posting period.
- 12.12.5. The Contractor shall prepare a report to the Department of Pesticide Regulation of pesticide applications for each site at which a pesticide application occurred. The report shall include the name and address of the site, date and location of application, pesticide product name, and the quantity of pesticide used.
- 12.12.6. The Contractor shall be solely responsible for complying with the requirements of the District Integrated Pest Management Policy G-3200. This policy is available online at https://sandiegounified.org/departments/integrated_pest_management.
- 12.12.7. The Contractor shall ensure that proposed pest control operators are educated and trained in the use of current pesticides approved for use by the District Integrated Pest Management Office, and that applicators follow label directions, precautions, and application regulations.
- 12.12.8. The Contractor shall provide the District Integrated Pest Management Office with copies of all reports the Contractor is required to prepare and submit to the Department of Pesticide Regulation.

- 12.12.9. The Contractor shall obtain, ten (10) Working days prior to any pesticide application at a site, written approval from the District Integrated Pest Management Office, that the material Specifications proposed for application are for District approved pesticides, and that the area of intended use of the proposed pesticide is consistent with the pesticide label Specifications. The Contractor shall ensure pesticide application is included in the SWPPP or initiate an amendment to the SWPPP to incorporate the application of pesticides to ensure stormwater best management practices are in place to prevent contamination of stormwater or non-stormwater runoff.
- 12.12.10. The Contractor shall provide the District Integrated Pest Management Office certification that any company engaged in pest control Work possess a valid Pest Control Business License and that landscape maintenance Subcontractors who perform pest control Work possess a valid Qualified Applicator's Certificate in the category of Landscape Maintenance (Category B). For Work of a structural nature, the pest control operator must possess either a valid Qualified Applicator's Certificate in the category of Residential, Industrial and Institutional (Category A), or a structural Pest Control License Branch 2 (Field Representative), or Branch 3 (Wood Destroying Organisms).

12.13. REPORTING/INVESTIGATING INCIDENTS AND ACCIDENTS

- 12.13.1. The Contractor's New Employee Orientation shall include information about employee responsibility for reporting all injuries, illnesses, property damage and near miss incidents. Contractor shall promptly report all such occurrences to the District and unless directed otherwise, take the lead in the investigation, documentation and initiation of corrective action. Contractor shall keep records of all incident/accident investigations in a format acceptable to the District and shall provide the District with a copy within 24 hours of the occurrence.
- 12.13.2. Contractor shall develop a written notification and investigation procedure acceptable to the District. The Contractor's Safety Representative shall oversee the investigation of all incident and accident cases and reports. Information derived from such reports shall be issued as "lessons learned" to all employees on the Project.

12.14. ASSESSMENTS AND INSPECTIONS

- 12.14.1. The Contractor shall establish a documented assessment process acceptable to the District which measures compliance with the Project ES&H Execution Plan and Contractor's own ES&H processes.
- 12.14.2. The District may perform periodic safety assessments of the Project. The Contractor shall provide the District with timely, complete and open access to its safety process, files, records, etc., and shall participate in this assessment as required.
- 12.14.3. The Contractor will ensure its personnel are aware of and comply with the procedures to be taken in the event of an inspection by any regulatory agency.
- 12.14.4. The Contractor shall immediately notify the District Construction Manager and Safety Supervisor when a regulatory agency inspector of any type requests entry onto the Jobsite.
- 12.14.5. Following any regulatory agency inspection, the Contractor shall submit a written report to the District Construction Manager or Safety Supervisor which details all aspects of the inspection.

12.15. EMERGENCIES AND EVACUATIONS

- 12.15.1. The Contractor shall develop an Emergency Response Plan and shall provide all emergency equipment and supplies needed to support the Work and each Work location. The plan will address emergency evacuation, medical emergencies, natural disasters, etc. The plan shall be submitted and acceptable to the District. The plan shall include

emergency alarm systems, assembly and evacuation points, an employee head count process, and provisions for employee training before entering the Jobsite. Periodic tests and drills shall be conducted as required.

- 12.15.2. The Contractor shall ensure that Emergency Response Plan requirements are clearly communicated to its Project personnel. Such communication and employee comprehension and participation shall be documented.

12.16. BLOOD BORNE PATHOGENS

- 12.16.1. Contractor employees who are designated as responsible for rendering first aid or medical assistance shall be included in their employer's blood-borne pathogen program in accordance with 29 CFR 1910.1030 and, shall be properly trained regarding their responsibilities, required control measures, and personal safety. Proper personal protective equipment shall be used when exposure hazards exist. Each Contractor employee whose job duties puts them at risk of exposure (i.e. medic, nurse, first aid person, etc.) shall be offered vaccinations and documentation of the vaccination or declination shall be maintained and made available to the District upon request.
- 12.16.2. Contractor shall provide all its employees with a general overview on the hazards associated with blood borne pathogens, possible means of exposure, and proper control methods.

12.17. AIR SURVEILLANCE PROGRAM

- 12.17.1. As required, the Contractor shall develop a written Air Surveillance Procedure. All operations, materials, and equipment shall be evaluated to determine the presence of hazardous environments or if hazardous or toxic agents could be released into the Work environment. All logs and records shall be maintained on-site for sampling, monitoring, and identifying the source of contaminants. These records shall be made available to the District. A competent person, whose resume and qualifications shall be submitted and determined acceptable by the District, shall conduct all evaluations, air monitoring and/or sampling.
- 12.17.2. The Contractor shall perform inspections to identify and mitigate Project and/or public risks and exposures to potential toxic, hazardous or explosive atmospheres.
- 12.17.3. The Contractor shall provide equipment adequate for the environmental sampling and monitoring of atmospheres and shall ensure that the equipment is calibrated per the Manufacturer recommendations.

12.18. HEAT STRESS PREVENTION

- 12.18.1. As required, Contractor shall have operating and emergency procedures for heat stress.
- 12.18.2. Contractor shall ensure that all field employees, especially front line supervisors, are trained on the warning signs/symptoms of early heat related disorders, and instructed on the clothing and Work methods best suited to avoid heat stress. Stay times or monitoring methods shall be developed to reduce the possibility of heat related disorders, if necessary.
- 12.18.3. Contractor shall provide an immediately accessible, adequate, and sanitary potable water supply during all periods of the day and have available electrolyte replacement drinks or tablets during seasons of the year when heat stress may occur.

12.19. HOUSEKEEPING, FIRE PREVENTION & PROTECTION

- 12.19.1. All eating and sanitary facilities shall be maintained in a clean and sanitary condition at all times. Contractor must provide the necessary resources to accomplish this, including

adequate washing facilities with soap and disposable towels and whatever labor is required to clean and maintain a high level of sanitation.

- 12.19.2. Unless specified elsewhere in the contract, Contractor shall provide clean, potable drinking water for its employees in a safe, hygienic manner at all Worksites. Single use cups shall be provided in a sanitary dispenser. These cups shall be replenished as needed during the day and trashcans provided for their disposal. "Community" or common use cups shall not be used.
- 12.19.3. Unless specified elsewhere in the contract, Contractor shall provide and maintain its own sanitary toilet facilities for its employees. The daily facilities cleaning, and maintenance, and method and location of waste disposal shall be to a high standard acceptable to the District.
- 12.19.4. Contractor shall provide all fire protection and prevention equipment necessary for its operations, including, but not limited to fire hoses, nozzles, extinguishers, etc. Contractor shall provide an adequate number of fire extinguishers of the correct size and type for its Work activities. Extinguishers shall be maintained per Manufacturer's recommendations, inspected monthly, and tested annually. Contractor shall train employees in the proper use of fire extinguishers.
- 12.19.5. Contractor shall monitor its Work and office areas to ensure that all doors, stairwells, aisles and means of egress are kept clear and unobstructed at all times.
- 12.19.6. Contractor shall ensure all exits are clearly marked and adequately lighted, and that all emergency lights remain functional.
- 12.19.7. Contractor shall ensure that the handling, storage, and use of flammable and combustible liquids is performed properly, that these liquids are dispensed in safety cans manufactured to a recognized standard acceptable to the District, and areas designated for these activities are maintained in an orderly fashion. All hazardous areas shall be posted with appropriate signs and access shall be controlled.
- 12.19.8. Where temporary welding enclosures are required, Contractor shall ensure that these enclosures are constructed with flame resistant materials (such as fire blanket).
- 12.19.9. Contractor shall instruct its employees in regards to the facility/Project smoking policy and monitor to ensure that posted "no-smoking" zones are observed.
- 12.19.10. Contractor office areas shall be monitored to reduce and control storage and loading of combustible materials. Material shall be well arranged, and aisles shall be maintained open and clear of obstructions. Stored material shall be kept away from heaters, lamps, hot pipes, equipment, and machinery and the use of extension cords minimized.
- 12.19.11. Contractor personnel whose Work tasks are in the vicinity of fire cabinets and equipment, fire hydrants, and fire lanes shall keep them clear and unobstructed.
- 12.19.12. Contractor shall maintain a minimum of 18 inches or 1/2 meter of free space around sprinkler heads when working in facilities having sprinkler systems.
- 12.19.13. Contractor shall ensure that combustible waste containers are emptied regularly; equipment, tables, and floors are free from oil or oily rags; and oily rag containers are kept covered and emptied regularly. Janitor/storage closets shall be maintained in an orderly condition and shall not be used to store quantities of hazardous or toxic chemicals. Electrical, mechanical, and MDF rooms shall be kept in order and free of combustible storage materials.
- 12.19.14. Contractor shall protect its employees against welding and cutting hazards. Contractor's ES&H Plan shall address fire concerns including fire watches where necessary, welding fumes, preservative coatings, respiratory protection, eye/head/body protection, etc.

Welding and cutting apparatus shall be inspected before each use. Cutting torch assemblies shall be equipped with pressure relief valves, back flow prevention devices, and flash arrestors.

- 12.19.15. Contractor shall ensure that employees are trained in and comply with the requirements for proper fire prevention and equipment use when welding or cutting.
- 12.19.16. Contractor shall effectively ground the frame of Arc-welding and cutting machines that incorporate a power outlet.
- 12.19.17. Contractor shall develop a written Cutting, Welding and Grinding Procedure for the maintenance and inspection of welding, grinding, or cutting equipment and ensure that the procedure is implemented and maintained.
- 12.19.18. Unless otherwise specified by the District, Contractor shall not permit open fires on the Jobsite.

12.20. FALL PREVENTION/PROTECTION

- 12.20.1. The Contractor ES&H Plan shall include a written Fall Prevention/Protection Procedure acceptable to the District, which makes maximum use of primary fall protection systems, such as scaffolds, aerial lifts, nets, personnel hoists, etc.
- 12.20.2. Contractor shall require the inspection of fall protection equipment prior to each use.
- 12.20.3. Contractor shall adopt a 100% fall protection policy that makes provision for secondary fall protection (full-body harness) for all employees who are working or traveling more than 6 feet or 2 meters above ground.
- 12.20.4. Contractor shall review its scope of Work to identify the methods to achieve 100% fall protection prior to commencement of such Work. Selection of personal fall protective equipment shall be based on the type of Work; the Work environment, the weight, size, and shape of the user; the type and position of anchorage; and the length of the lanyard. Where lifeline systems are used, anchor points shall be capable of supporting at least 5,000 pounds or 2275 kg. Lifelines shall be installed and maintained by qualified persons who are competent and possess the rigging knowledge necessary to ensure the integrity and safety factors necessary for lifeline system installation. Lanyards shall be secured to vertical lifelines by rope grabs only. Knots, painters-hitches, or loops are not acceptable. Horizontal lifelines shall have tie-off points at least waist high.
- 12.20.5. Contractors using retractable lifeline devices shall secure them by means acceptable to the District and in all cases by a means capable of supporting at least 5000 pounds or 2275 kg.
- 12.20.6. Contractor shall require employees to wear an approved safety harness/lanyard system if they Work from ladders where the fall exposure is more than 6 feet or 2 meters, and they are unable to maintain 3-point contact.

12.21. SCAFFOLDING

- 12.21.1. Contractor shall have a written Scaffolding Procedure and use scaffold material acceptable to the District.
- 12.21.2. Scaffold platforms shall be fully planked or decked out, capable of supporting 4 times the maximum intended load to be imposed upon them, and all sides protected by standard guardrail systems. The top rail shall be approximately 42 inches or 110 cm from the platform. A mid-rail and 4 inch or 10 cm toe-board shall be installed.
- 12.21.3. Contractor erected scaffolds where employees are Working/passing below shall have planking or netting installed from the platform to the top rail.

- 12.21.4. Contractor shall develop a scaffold tagging system which identifies the status of each scaffold. Suggested system uses a red tag to indicate scaffolds under construction or demolition, yellow to indicate scaffolds that are complete but have hazards associated with them, and green to indicate scaffolds erected to a complete, safe standard.
- 12.21.5. Contractor shall erect or modify scaffolds under the direction of a trained, competent scaffold builder whose qualifications must be made available at the District's request. The competent person shall sign all scaffold tags and perform and document inspections before initial use, including initial use following alteration, and daily thereafter.
- 12.21.6. Contractor shall provide safe access/egress to all levels of scaffolds. Scaffold platform accesses shall be protected to prevent the possibility of accidental fall through utilizing secured access gates.
- 12.21.7. Special scaffolds (hanging scaffolds, 2 point suspension scaffolds, etc.) shall be designed by a competent engineer and erected with all necessary personnel safety equipment installed, such as rope grabs and lifelines.
- 12.21.8. Contractor must have a qualified, professional engineer design all scaffolds over 125 feet or 38 meters in height.
- 12.21.9. All scaffolds erected by the Contractor shall have casters, jackscrews, or base plates installed. Mudsills shall be used where required. Scaffolds shall be level and plumb, capable of supporting at least four times the anticipated load, and secured to a solid structure whenever possible.
- 12.21.10. Contractor shall provide scaffold user training to all employees, shall verify employee comprehension by testing and shall maintain training and testing records which will be made available to the District upon request.

12.22. BARRICADES

- 12.22.1. Contractor is responsible for properly erecting and maintaining barricades and barriers in such a manner that they provide adequate protection and do not impede the Work of other Contractors unless the District approves such placement. All floor and roof openings into which persons can accidentally walk or fall through shall be guarded by a physical barrier or covered.
- 12.22.2. Contractor shall barricade all floor openings, or install properly labeled and substantial covers (3/4 inch, or equivalent metric, exterior grade plywood able to withstand at least twice the anticipated load). All floor-opening covers shall be stenciled or painted with this statement: "OPEN HOLE - DANGER, DO NOT REMOVE."
- 12.22.3. Barricades and barriers erected by the Contractor shall have appropriate signs and tags indicating the nature of the hazard and the responsible supervisor. Barricades left after dark on or in close proximity to roadways shall be properly equipped with flashing amber lights.
- 12.22.4. Contractor shall provide and use appropriate barrier devices to identify the nature of the job hazard involved (i.e., yellow and black for "CAUTION" or red and black for "DANGER"). Barrier devices, including barrier tape, shall not be used as a substitute for a barricade as they do not offer adequate protection from falls. Barrier devices shall be used only in those applications where temporary identification of a hazard is needed; but not as a primary means of protecting employees from exposure.
- 12.22.5. Contractor shall ensure that employees understand and comply with barricade and barrier procedures (i.e. prohibited entry into red barrier taped areas).

12.23. FLOOR & WALL OPENINGS

- 12.23.1. Contractor shall review the fall hazards involved in its scope of Work and construct standard handrail systems where required. Handrails shall be constructed with the top rail 42 inches or 110 cm from the floor or platform level and shall have a mid-rail and toe-board. Toe-boards shall extend 4 inches or 10 cm above the floor or platform level.
- 12.23.2. Contractor shall install vertical support posts for handrails at intervals of not more than 8 feet or 2.5 meters.
- 12.23.3. All floor and roof holes through which equipment, materials, or debris can fall shall be covered.

12.24. EXCAVATIONS & TRENCHING

- 12.24.1. Contractor shall not commence any excavation or trenching Work, until they have obtained permission and complied with the conditions of all required approval and permit authorities. Permits shall be kept on file on-site and made available to the District upon request.
- 12.24.2. Contractor shall provide at the Jobsite a competent person whose resume and qualifications have been submitted to and accepted by the District, who will classify all soils and perform daily inspections of all excavations/trenches. These inspections shall be documented, kept on file on-site, and made available to the District upon request.
- 12.24.3. Contractor shall have an engineered drawing for reference showing the location of all underground services and/or utilities, and will make all required notifications prior to commencing any excavation.
- 12.24.4. Contractor shall ensure that spoil material is kept at least 3 feet or 1 meter away from the excavation edge.
- 12.24.5. Where trenches or excavations will exceed 4 feet or 1.5 meters in depth, the Contractor shall use protective systems acceptable to the District. No more than 25 feet or 7 meters of lateral travel shall be required in any trench to reach a ladder. Warning signs and barricades shall be installed in a manner that prevents accidental entry into the trenched or excavated area.

12.25. VESSELS AND CONFINED SPACES

- 12.25.1. Where confined space Work is anticipated, Contractor shall have a written Confined Space Procedure that is acceptable to the District and which requires that all such Work be performed only on the basis of a Contractor issued logged and numbered permit. Contractor is responsible for air evaluation and monitoring in confined spaces. At a minimum, in newly constructed confined spaces with little hazard of airborne contamination, monitoring for oxygen and explosive gasses shall be conducted. Monitoring equipment shall be provided by the Contractor, calibrated to Manufacturer recommendations and all calibration shall be documented. All employees conducting air monitoring shall have proper, documented training. All calibration and training records shall be made available to the District upon request.
- 12.25.2. The Contractor shall ensure that all employees have awareness training regarding the hazards of confined spaces and the procedures to be followed. Special training shall be provided to all entry supervisors, entrants, and attendants. The Contractor shall ensure that entry supervisors know, understand and execute their full responsibilities.
- 12.25.3. Contractor shall review its Work areas and ensure confined spaces have been identified and marked accordingly. Contractor shall examine each confined space before initial entry to evaluate the specific hazards and safety precautions.

12.25.4. Prior to each entry into a confined space Contractor shall ensure:

- Proper ventilation equipment is used to purge or supply air to the confined space,
- All electrical service is low voltage or GFCI protected,
- Adequate access/egress from the confined space is provided,
- A task specific rescue plan has been developed and reviewed with all involved employees, and
- All external sources of atmospheric contamination are isolated.

12.25.5. Contractor shall evaluate all confined spaces for possible heat stress.

12.25.6. Contractor shall ensure that all personnel responsible for safety watches (confined space attendants) are easily identified, properly trained and aware of the duties associated with each emergency situation that may occur within the confined space.

12.25.7. Contractor shall ensure that an emergency rescue team is available for all permit-required confined space entries and that all employees know how to summon assistance.

12.25.8. Contractor shall not permit entry into any permit-required confined space until the permit system has been properly executed. The permit shall be conspicuously posted at the confined space and all entrants must sign a log upon entering and exiting the confined space.

12.26. LOCK OUT/TAG OUT PROCEDURE

12.26.1. Where applicable, Contractor shall develop an effective and compliant written lock-out/tag-out procedure.

12.26.2. Contractor shall ensure that all employees have instruction on the specific lockout/ tagout procedure and comprehension testing shall be conducted to verify knowledge and understanding of the procedure. Records of training and testing shall be kept, filed on-site, and made available to the District upon request.

12.27. PORTABLE LADDERS - CONTROL & INSPECTION

12.27.1. Contractor shall monitor ladders to ensure all ladders used on the Project are constructed of wood or fiberglass (not metal) have non-slip feet, and that wooden ladders have been treated with preservative.

12.27.2. Contractor will erect ladders so that access/egress areas are unobstructed.

12.27.3. Contractor shall have a Ladder Inspection Procedure. A documented quarterly inspection of ladders is recommended.

12.27.4. Contractor will use ladders for egress and/or to conduct low level Work of short duration and will not use ladders in lieu of scaffolds as a primary means of conducting Work of longer duration.

12.28. CRANES AND MATERIAL HANDLING

12.28.1. Contractor shall provide the resources necessary for inspection and maintenance of rigging and lifting equipment and shall monitor all lifts to ensure that acceptable lifting practices are followed.

12.28.2. Tag lines shall be used on all lifts.

12.28.3. Contractors who are performing lifts in excess of 10 tons shall submit a lifting plan to the District for review and acceptance prior to performing the lift. If the lift is over 50 tons or classified as critical (exceeding 90% of the crane capacity chart, any two-crane lift or any lift over operating or occupied facilities, process pipe racks or near power lines) the

Contractor shall submit a detailed rigging plan with all applicable supporting calculations to the District for review and acceptance prior to the lift.

- 12.28.4. Contractor shall designate a qualified supervisor to determine the methods and develop plans for rigging operations to ensure safe lifts.
- 12.28.5. Contractor shall ensure that the equipment operators they provide are adequately trained and informed of their responsibility to operate their equipment within design limits.
- 12.28.6. All cranes supplied by Contractor shall have current, annual, documented inspections of sufficient detail to be acceptable to the District. Documentation of such inspections shall be made available to the District prior to initial Jobsite use.
- 12.28.7. Contractor shall provide and ensure that operators keep daily inspection logs for all equipment. No equipment shall be operated if hazardous conditions are identified.
- 12.28.8. Contractor shall ensure that chain-falls, inertia reels, etc. have a documented inspection annually (including load tests). All rigging equipment shall undergo a visual inspection prior to each use and a documented inspection quarterly (a color code system shall be used to achieve this). All capacities shall be clearly indicated on lifting devices.
- 12.28.9. All rigging shall be stored properly (i.e. on racks or in protected areas).
- 12.28.10. Contractor shall ensure all crane operations maintain minimum safe distances from all high voltage lines. Up to 50KV the distance shall be 10 feet or 3 meters.
- 12.28.11. Contractor shall ensure that the counter weight and housing swing radius of all cranes is properly barricaded whenever it is possible personnel may come into contact with or be struck by them.

12.29. SUSPENDED PERSONNEL PLATFORMS

- 12.29.1. Contractor shall notify the District prior to using any suspended personnel platform and develop a Lift Procedure to be reviewed and accepted by the District prior to their use. The procedure shall include, but not be limited to, employee training, pre-lift meetings, trial lifts, and platform inspection.
- 12.29.2. Personnel platforms (baskets) provided by Contractor shall be designed by a qualified engineer and Manufactured by competent personnel. They shall have permanent markings indicating maximum weight.
- 12.29.3. If the District approves the use of crane suspended personnel platforms, Contractor shall thoroughly inspect the crane/derrick and ensure it has an operational anti two block device and locking devices on the hook. Free fall capacity, if present, shall be positively locked out or disabled. The area under the lift shall be isolated by barrier tape and signs.
- 12.29.4. Contractor shall provide a positive means of communication between the crane operator and employees in a crane suspended personnel platform. Employees in the platform shall wear full body harnesses attached to a designated anchor point.

12.30. ARTICULATING BOOM PLATFORMS

- 12.30.1. Machines Manufactured and used for elevated personnel platform Work (JLG, Hi-lift, etc.) shall be operated and maintained in accordance with Manufacturer recommendations and only by trained and qualified individuals. Training and comprehension test records shall be maintained on file at the Jobsite and made available to the District upon request.
- 12.30.2. All persons inside Work platforms shall wear a full body harness attached to the Manufacturer's designated anchor point. A fire extinguisher shall be provided on all such

equipment. Equipment used to hoist personnel shall not be used for material, if this constitutes a hazard.

12.31. COMPRESSED GAS CYLINDERS

- 12.31.1. Contractor shall provide cradles and/or cages for lifting compressed gas cylinders and ensure that cylinders being transported are secured and in the upright position.
- 12.31.2. Unless otherwise directed by the District, and where applicable, the Contractor shall create a Gas Cylinder Use and Storage Procedure that allows for proper use and storage of compressed gas cylinders. The procedure shall include segregation by type, proper signage, protective isolation of fuel gasses from oxygen, provisions to keep cylinder caps in place when provided by the supplier, positive upright securing of bottles, and maintenance of safe distances from ignition sources.
- 12.31.3. Contractor shall ensure that each individual cylinder turned off by a key wrench is provided with a key wrench whenever in use.

12.32. ELECTRICAL EQUIPMENT INSPECTION / ASSURED GROUNDING / GFCI

- 12.32.1. Contractor shall implement use of ground fault circuit interrupters (GFCI) on all temporary electrical applications.
- 12.32.2. Contractor shall train employees regarding electrical inspection and electrical safety.
- 12.32.3. Contractor shall ensure all tools are checked for electrical continuity after repairs are made.

12.33. VEHICLE OPERATIONS

- 12.33.1. Contractor shall ensure all vehicles are registered/licensed, maintained in a roadworthy condition, and operated in a safe manner.
- 12.33.2. Contractor shall ensure all persons operating vehicles are healthy and unimpaired, have appropriate and required operator's licenses, and observe established road regulations and/or Jobsite regulations.
- 12.33.3. Contractor shall provide a seat belt for each vehicle passenger and enforce the wearing of seat belts any time a vehicle is in motion.

ARTICLE 13**13. TESTS AND INSPECTIONS****13.1. TESTS; INSPECTIONS; OBSERVATIONS**

- 13.1.1. If the Contract Documents, laws, ordinances or any public authority with jurisdiction over the Work requires the Work, or any portion thereof, to be specially tested, inspected or approved (collectively "Testing"), the Contractor shall give the Architect and the Project Inspector written notice of the readiness of such Work for Testing at least two (2) Working days prior to the time for the conducting of such Testing. If testing is by an authority other than the District, the Contractor shall inform the Architect and Project Inspector not less than two (2) Working days prior to the date fixed for such Testing. Contractor shall indicate on the Contract Schedule the dates of special tests or inspections.
- 13.1.2. The Contractor shall not cover up any portion of the Work subject to testing and inspection prior to the completion, inspection, punch list correction, and sign-off by the Project Inspector of same. In the event that any portion of the Work subject to Testing shall be covered up by Contractor prior to completion, Contractor shall be responsible for the uncovering of such portion of the Work as is necessary without adjustment of the Contract Price or the Contract Time on account thereof. Work such as, but not limited to drywall, insulation, ceiling tile installation, roofing, and concrete shall not be commenced without the approval of the Project Inspector.
- 13.1.3. Costs for special tests and inspection of materials shall be paid by the District as provided for herein. The Contractor shall provide all materials to be tested at no additional cost to the District. The Contractor shall provide safe access to all locations where materials are to be tested. Within twenty (20) days after the establishment of the Accepted Contract Schedule pursuant to Article 6.5 hereof, the District shall submit to the Contractor a written list of the portions of the Work subject to special tests or inspections to be paid for by the District along with the number of hours or costs of testing or inspection allocated for each such portion of the Work. Should any act, omission or other conduct of the Contractor, any of its Subcontractors, of any tier, or Material Suppliers cause the number of hours or the costs of such tests or inspections to exceed that set forth in the District's list submitted pursuant to the foregoing, the Contractor shall be solely responsible for all such excess costs and the District may deduct such amount from any portion of the Contract Price then or thereafter due the Contractor.
- 13.1.4. The District shall select duly qualified person(s) or testing laboratory(ies) to conduct the special tests and inspections to be paid for by the District and required by the Contract Documents. All such tests and inspections shall be in conformity with Title 24 of the California Code of Regulations. Where inspection or testing is to be conducted by an independent laboratory or testing agency, materials or samples thereof shall be selected by the laboratory, testing agency, the Project Inspector or the Architect and not by the Contractor, Subcontractor or any tier thereof.
- 13.1.5. If the Architect, the Project Inspector, or public or quasi-public authority having jurisdiction over the Work determine that portions of the Work require additional testing, inspection or approval, ("Additional Tests") the Architect and the Project Inspector shall, upon written authorization from the District, instruct the Contractor to make arrangements for such Additional Tests by an entity acceptable to the District, and the Contractor shall give timely notice to the Architect and the Project Inspector of when and where the Additional Tests are to be made so the District's representative(s) and the Architect may observe such procedures. The District shall bear the costs of such Additional Tests, except to the extent that such Additional Tests reveal any failure of the Work to comply with the requirements of the Contract Documents, in which case the Contractor shall bear all costs made necessary by such failures, including without limitation, the costs of corrections, repeat

tests, inspections or approvals and the costs of the Architect's services or its consultants in connection therewith.

- 13.1.6. It is the Contractor's responsibility when calling for testing or inspections to verify and confirm that the Work is complete, according to Contract Documents and ready for inspection. Any re-inspections due to incomplete Work are subject to re-inspection fees at a minimum rate of \$100 per hour.

13.2. DELIVERY OF CERTIFICATES

- 13.2.1. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

13.3. TIMELINESS OF TESTS, INSPECTIONS AND APPROVALS

- 13.3.1. Tests or inspections required and conducted pursuant to the Contract Documents shall be made or arranged by Contractor to avoid delay in the progress of the Work.

ARTICLE 14**14. UNCOVERING AND CORRECTION OF WORK****14.1. INSPECTION OF THE WORK**

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

14.1.2. Inspections, tests, measurements, or other acts of the Architect and the Project Inspector hereunder are for the sole purpose of assisting them in determining that the Work, materials, equipment, progress of the Work, and quantities generally comply and conform with the requirements of the Contract Documents. No inspection by the Architect or District Project Inspector shall constitute or imply acceptance of Work inspected.

14.2. UNCOVERING OF WORK

14.2.1. If any portion of the Work is covered contrary to the request of the Architect, the Project Inspector or the requirements of the Contract Documents, it must, if required by the Architect or the Project Inspector, be uncovered for observation by the Architect and the District's Representative and be replaced at the Contractor's expense without adjustment of the Contract Time or the Contract Price.

14.3. REJECTION OF WORK

14.3.1. Prior to the District's Final Acceptance of the Work, any Work or materials or equipment forming a part of the Work or incorporated into the Work which is defective or not in conformity with the Contract Documents may be rejected by the Architect or the Project Inspector and the Contractor shall correct such rejected Work without any adjustment to the Contract Price or the Contract Time, even if the Work, materials or equipment have been previously inspected by the Architect or the Project Inspector or even if they failed to observe the defective or non-conforming Work, materials or equipment.

14.4. CORRECTION OF WORK

14.4.1. The Contractor shall promptly correct any portion of the Work rejected by the Architect or the Project Inspector for failing to conform to the requirements of the Contract Documents, or which is determined by them to be defective, whether observed before or after Substantial Completion, and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby. The Contractor shall bear all costs of correcting and/or replacing destroyed or damaged construction, and components which do not operate properly, whether completed or partially completed, of the District or separate contractors, caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents, or which is defective. Contractor is also responsible for restoring permanent facilities used during the Work to their original or specified condition.

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

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

14.5. ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

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

ARTICLE 15**15. WARRANTIES****15.1. CONTRACTOR'S WARRANTY**

15.1.1. The Contractor warrants to the District that all materials and equipment furnished under the Contract Documents shall be new, of good quality and of the most suitable grade and quality for the purpose intended, unless otherwise specified in the Contract Documents. All Work shall be performed in accordance with accepted industry practices and shall be of good quality, free from faults and defects and in conformity with the requirements of the Contract Documents. If required by the Architect or the District, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment incorporated into the Work. Any Work or portion thereof not conforming to these requirements may be deemed defective. Where there is an approved substitution of, or alternative to, material or equipment specified in the Contract Documents, the Contractor warrants to the District that such installation, construction, material, or equipment shall equally perform the function and have the quality of the originally specified material or equipment. The Contractor expressly warrants the merchantability, the fitness for use, and quality of all substitute or alternative items in addition to any warranty given by the Manufacturer or supplier of such item.

15.2. DISTRICT'S FINAL ACCEPTANCE; WARRANTY PERIOD

15.2.1. For Projects that are completed in their entirety and not performed in phases, the warranty or guarantee period under the Contract Documents shall be for a period of two (2) years and shall commence on the date of Final Acceptance of the Work, unless specified.

15.2.2. For Projects that are completed in phases during performance of the Work, the warranty or guarantee period under the Contract Documents is for a period of two (2) years and shall commence on the date of Substantial Completion for the District's partial use or occupancy of portions of the Work, as certified by the Architect and the District, unless otherwise specified.

15.2.3 Nothing in this section shall be deemed to shorten the otherwise applicable statute of limitations period for claims by the District against Contractor for defects (latent or patent) in the Work.

15.3. WARRANTY WORK

15.3.1. If within two (2) years after the date of Final Acceptance, or Substantial Completion as provided in Article 15.2.2 above, any of the Work is found to be defective or not in accordance with the requirements of the Contract Documents, or otherwise contrary to the warranties contained in the Contract Documents, the Contractor shall commence all necessary corrective action not more than seven (7) days after receipt of a written notice from the District to do so, and to thereafter diligently complete the same. In the event that Contractor shall fail or refuse to commence correction of any such item within said seven (7) day period or to diligently prosecute such corrective actions to completion, the District may then without further notice cause such corrective Work to be performed and completed. In such event, Contractor and Contractor's Performance Bond Surety shall be responsible for all costs in connection with such corrective Work, including without limitation, general administrative overhead costs of the District in securing and overseeing such corrective Work.

15.3.2. Nothing contained herein shall be construed to establish a period of limitation with respect to any obligation of the Contractor under the Contract Documents. The obligations of the Contractor hereunder shall be in addition to, and not in lieu of, any other obligations imposed by any special guarantee or warranty required by the Contract Documents, guarantees or warranties provided by any Manufacturer of any item or equipment forming

a part of, or incorporated into the Work, or otherwise recognized, prescribed or imposed by law. Neither the District's Final Acceptance, the making of Final Payment, any provision in Contract Documents, nor the use or occupancy of the Work, in whole or in part, by District shall constitute acceptance of Work not in accordance with the Contract Documents nor relieve the Contractor or the Contractor's Performance Bond Surety from liability with respect to any warranties or responsibility for faulty or defective Work or materials, equipment and Workmanship incorporated therein.

15.4. GUARANTEE

15.4.1. Upon completion of the Work, Contractor shall execute and deliver to the District the form of Guarantee included within the Contract Documents. Pursuant to Article 7.4.2 herein, Contractor's execution and delivery of the form of Guarantee is an express condition precedent to any obligation of the District to disburse the Final Payment to the Contractor.

15.5. SURVIVAL OF WARRANTIES

15.5.1. The provisions of this Article 15 shall survive the Contractor's completion of Work under the Contract Documents, the District's Final Acceptance or the termination of the Contract.

ARTICLE 16**16. SUSPENSION OR TERMINATION OF WORK AND FORCE MAJEURE****16.1. DISTRICT'S RIGHT TO SUSPEND WORK**

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

16.2. ADJUSTMENTS TO CONTRACT PRICE AND CONTRACT TIME

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

16.3. TERMINATION FOR CAUSE

16.3.1. The District may terminate the Contract upon the occurrence of any one or more of the following events of the Contractor's default: (i) if the Contractor refuses or fails to prosecute the Work with diligence as shall insure Substantial Completion of the Work within the Contract Time, or if the Contractor fails to substantially Complete the Work within the Contract Time; (ii) if the Contractor becomes bankrupt or insolvent, or makes a general assignment for the benefit of creditors, or if the Contractor or a third party files a petition to reorganize or for protection under any bankruptcy or similar laws, or if a trustee or receiver is appointed for the Contractor or for any of the Contractor's property on account of the Contractor's insolvency, and the Contractor or its successor in interest does not provide adequate assurance of future performance in accordance with the Contract Documents within ten (10) days of receipt of a request for such assurance from the District; (iii) if the Contractor repeatedly fails to supply sufficient skilled Workmen or suitable materials or equipment; (iv) if the Contractor repeatedly fails to make prompt payments to any Subcontractor, of any tier, or Material Suppliers or others for labor, materials or equipment; (v) if the Contractor disregards laws, ordinances, rules, codes, regulations, orders applicable to the Work or similar requirements of any public entity having jurisdiction over the Work; (vi) if the Contractor disregards proper directives of the Architect or the Construction Manager under the Contract Documents; (vii) if the Contractor performs Work which deviates from the Contract Documents and neglects or refuses to correct such Work; or (viii) if the Contractor otherwise violates in any material way any provisions or requirements of the Contract Documents. Once the District determines that sufficient cause exists to justify the action, the District may terminate the Contract without prejudice to any other right or remedy the District may have, after giving the Contractor and the Surety at least seven (7) days advance written notice of the effective date of termination. The District shall have the sole discretion to permit the Contractor to remedy the cause for the termination without waiving the District's right to terminate the Contract, or otherwise waiving, restricting or limiting any other right or remedy of the District under the Contract Documents or at law.

- 16.3.2. In the event that the Contract is terminated pursuant to this Article 16.3, the District may take over the Work and prosecute it to completion, by contract or otherwise, and may exclude the Contractor from the site. The District may take possession of the Work and of all of the Contractor's tools, appliances, construction equipment, machinery, materials, and plant which may be on the site of the Work, and use the same to the full extent they could be used by the Contractor without liability to the Contractor. In exercising the District's right to prosecute the completion of the Work, the District may also take possession of all materials and equipment stored at the site of the Work or for which the District has paid the Contractor but which are stored elsewhere, and finish the Work as the District deems expedient. In exercising the District's right to prosecute the completion of the Work, the District shall have the right to exercise its sole discretion as to the manner, methods, and reasonableness of the costs of completing the Work and the District shall not be required to obtain the lowest figure for completion of the Work. In the event that the District takes bids for remedial Work or completion of the Work, the Contractor shall not be eligible for the award of such contract(s).
- 16.3.3. In the event that the Contract is terminated pursuant to this Article 16.3, the District may demand that the Surety take over and complete the Work. The District may require that in so doing, the Surety not utilize the Contractor in performing and completing the Work. Upon the failure or refusal of the Surety to take over and begin completion of the Work within twenty (20) days after demand therefore, the District may take over the Work and prosecute it to completion as provided for above.
- 16.3.4. The District shall, in its sole and exclusive discretion, have the option of requiring any Subcontractor or Material Supplier to perform in accordance with its Subcontract or Purchase Order with the Contractor and assign the Subcontract or Purchase Order to the District or such other person or entity selected by the District to complete the Work.
- 16.3.5. In the event of termination under this Article 16.3, the Contractor shall not be entitled to receive any further payment of the Contract Price until the Work is completed. If the unpaid balance of the Contract Price as of the date of termination exceeds the District's direct and indirect costs and expenses for completing the Work, including without limitation, compensation for additional professional and consultant services, such excess shall be used to pay the Contractor for the cost of the Work performed prior to the effective date of termination with a reasonable allowance for overhead and profit. If the District's costs and expenses to complete the Work exceed the unpaid Contract Price, the Contractor and/or the Surety shall pay the difference to the District.
- 16.3.6. The Contractor and the Surety shall be liable for all damages sustained by the District resulting from, in any manner, the termination of this Contract under this Article 16.3, and for all costs necessary for repair and completion of the Work over and beyond the Contract Price.
- 16.3.7. In the event the Contract is terminated under this Article 16.3, and it is determined, for any reason, that the Contractor was not in default under the provisions hereof, the termination shall be deemed a Termination for Convenience of the District and thereupon, the rights and obligations of the District and the Contractor shall be determined in accordance with Article 16.4 hereof.
- 16.3.8. In the event the Contract is terminated pursuant to this Article 16.3, the termination shall not affect or limit any rights or remedies of the District against the Contractor or the Surety. The rights and remedies of the District under this Article 16.3 are in addition to, and not in lieu of, any other rights and remedies provided by law or otherwise under the Contract Documents. Any retention or payment of monies to the Contractor by the District shall not be deemed to release the Contractor or the Surety from any liability hereunder.

16.4. TERMINATION FOR CONVENIENCE OF THE DISTRICT

16.4.1. The District may at any time, in its sole and exclusive discretion, by written notice to the Contractor, terminate the Contract in whole or in part when it is in the interest of, or for the convenience of, the District. Notice is deemed given when sent. In such case, the Contractor shall be entitled to payment for: (i) Work actually performed and in place as of the effective date of such termination for convenience of the District, with a reasonable allowance for profit and overhead on such Work, (ii) reasonable termination expenses for reasonable protection of Work in place and suitable storage and protection of materials and equipment delivered to the site of the Work but not yet incorporated into the Work; and (iii) retainage on Work completed, provided that such payments exclusive of termination expenses shall not exceed the total Contract Price as reduced by payments previously made to the Contractor. The Contractor shall not be entitled to profit and overhead on Work, which was not performed as of the effective date of the termination for convenience of the District. The District's right to terminate under this paragraph shall be in addition to any other rights reserved to the District under this Agreement. Said termination shall not be deemed to be a breach of this Agreement and/or tortious conduct. Termination shall have no effect upon any of the rights and obligations of the parties arising out of any transaction occurring prior to the effective date of such termination.

16.5 FORCE MAJEURE

16.5.1 A force majeure refers to an unforeseeable extraordinary event or circumstance that occurs after the parties entered into a contract that is beyond their control and prevents, hinders, or delays one or both parties from performing and fulfilling their obligations, in whole or in part, under the contract as a result of war; terrorism; third party strike; riot; epidemic/pandemic, government directives/orders such as mandatory quarantine, travel restrictions, and decree to shutdown; violent forces of nature such as hurricane, flood, earthquake; and other acts of God.

16.5.2 The affected party(ies) shall be excused from the performance of any obligation imposed in the Contract Documents and the exhibits hereto for the duration of the force majeure event provided that the invoking party informs the other party in writing and demonstrates a causal link between the force majeure event and the affected party's failure to perform, without fault or negligence of the affected party, with no alternative means for performing its obligations or that it has taken all reasonable steps to avoid the operation of the force majeure clause ("duty to mitigate"). If Contractor satisfies the requirements herein, Contractor shall be entitled to a non-compensable equitable time extension,

16.5.3 Any non-performance, hindrance of performance, or delay of performance from the affected party(ies) will not be a default hereunder or a grounds for termination of this Contract.

ARTICLE 17**17. STATUTORY REQUIREMENTS****17.1. PROHIBITION ON HARASSMENT**

- 17.1.1. The District is committed to providing a campus and Workplace free of sexual harassment and harassment. It is the policy of the District that in connection with all Work performed under the Contract Documents, there will be no discrimination against any prospective or active employee engaged in the Work because of race, color, religion, national origin, ancestry, age, medical condition, marital status, sexual orientation, disability or veteran status. Harassment includes without limitation, verbal, physical or visual conduct which creates an intimidating, offensive or hostile environment such as racial slurs; ethnic jokes; posting of offensive statements, posters or cartoons or similar conduct. Sexual harassment includes without limitation the solicitation of sexual favors, unwelcome sexual advances, or other verbal, visual or physical conduct of a sexual nature.
- 17.1.2. Contractor shall adopt and implement all appropriate and necessary policies prohibiting any form of discrimination in the Workplace, including without limitation harassment on the basis of any classification protected under local, state or federal law, regulation or policy. The Contractor agrees to comply with applicable federal and California laws, including, but not limited to, Labor Code §1735. Contractor shall take all reasonable steps to prevent harassment from occurring, including without limitation affirmatively raising the subject of harassment among its employees, expressing strong disapproval of any form of harassment, developing appropriate sanctions, informing employees of their right to raise and how to raise the issue of harassment and informing complainants of the outcome of an investigation into a harassment Claim. Contractor shall require that any Subcontractor or Sub-Subcontractor performing any portion of the Work adopt and implement policies in conformity with this Article 17.1.
- 17.1.3. Contractor shall not permit any person, whether employed by Contractor, a Subcontractor, of any tier, or any other person or entity, performing any portion of the Work at or about the Site to engage in any prohibited form of harassment. Any such person engaging in a prohibited form of harassment directed to any individual performing or providing any portion of the Work at or about the Site shall be subject to appropriate sanctions in accordance with the anti-harassment policy adopted and implemented pursuant to Article 17.1.2 above. Any such person engaging in a prohibited form of harassment directed to any student, faculty member or staff of the District, or directed to any other person on or about the Site shall be subject to immediate removal and shall be prohibited thereafter from providing or performing any portion of the Work. Upon the District's receipt of any notice or complaint that any person employed directly or indirectly by Contractor in performing or providing the Work has engaged in a prohibited form of harassment, the District shall promptly undertake an investigation of such notice or complaint. In the event that the District, after such investigation, reasonably determines that a prohibited form of harassment has occurred, the District shall promptly notify the Contractor of the same and direct that the person engaging in such conduct be immediately removed from the Site. Unless the District's determination that a prohibited form of harassment has occurred is grossly negligent or without reasonable cause, District shall have no liability for directing the removal of any person determined to have engaged in a prohibited form of harassment nor shall the Contract Price or the Contract Time be adjusted on account thereof.
- 17.1.4. Contractor and the Surety shall defend, indemnify and hold harmless the District and its employees, officers, Board of Education, agents, and representatives from any and all Claims, liabilities, judgments, awards, actions or causes of actions, including without limitation, attorneys' fees, which arise out of, or pertain in any manner to: (i) the assertion by any person dismissed from performing or providing Work at the direction of the District pursuant to Article 17.1.3 above; or (ii) the assertion by any person that any person directly or indirectly under the employment or direction of the Contractor has engaged in a

prohibited form of harassment directed to or affecting such person. The obligations of the Contractor and the Surety under the preceding sentence shall be in addition to, and not in lieu of, any other obligation of defense, indemnity and hold harmless whether arising under the Contract Documents, at law or otherwise; these obligations shall survive the completion of the Work or the termination of the Contract.

17.2. WAGE RATES; EMPLOYMENT OF LABOR

- 17.2.1. Attention is called to the fact that State of California prevailing wage requirements apply to this project.
- 17.2.2. Pursuant to the provisions of Articles 1 and 2 of Chapter 1, Part 7, Division II, of the Labor Code of the State of California (Labor Code §§1720 *et seq.* and implementing regulations of the Department of Industrial Relations), Title 8, California Code of Regulations, Chapter 8, Subchapter 3, commencing with §16000, for any “public works” (as that term is defined in the statutes), there shall be paid to each Worker of the Contractor, or any Subcontractor, of any tier, engaged in the Work, not less than the general prevailing wage rate, and not less than the general prevailing rate of per diem wages for holidays and overtime work, for each craft, classification or type of worker needed to execute the work contemplated under this Contract regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor, of any tier, and such Worker. For purpose of compliance with prevailing wage law, the Contractor shall comply with provisions applicable to an awarding body. Compliance with state prevailing wage law includes without limitation: payment of at least prevailing wage as applicable; overtime and working hour requirements; apprenticeship obligations; payroll recordkeeping requirements; and other obligations as required by law.
- 17.2.3. Copies of the prevailing rate of per diem wages applicable to this Project are on file at the District's office, and shall be made available to any interested party on request; or may be found on the Internet at: <http://www.dir.ca.gov/DLSR/PWD>. The Contractor shall post at appropriate conspicuous weatherproof points on the site of the Project a schedule showing the Prevailing Wage Determinations published by the Director of the California Department of Industrial Relations, which are applicable to the Project.
- 17.2.4. Contractor is responsible for ascertaining and complying with all current general prevailing wage rates for crafts and any rate changes that occur during the life of the contract; and shall ensure that the above requirements are included in all its contracts and any layer of subcontracts for activities for the Project.
- 17.2.5. Contractor shall certify to the District on each Payment Request Form, that prevailing wages were paid to eligible workers who provided labor for work covered by the payment request and that the Contractor and all subcontractors complied with prevailing wage laws. Prior to the release of any retained funds under this Agreement, the Contractor shall submit to the District a certificate signed by the Contractor and all subcontractors performing public works activities stating that prevailing wages were paid as required by law.
- 17.2.6. Failure to comply with prevailing wage laws and/or failure to employ apprentices as required by law shall subject Contractor and/or its Subcontractors to penalties, including forfeitures and debarment under Labor Code §§1775; 1776; 1777.1; 1777.7 and 1813.
- 17.2.7. Nothing contained herein shall be deemed to supersede any applicable laws, orders or regulations issued by competent authority governing wages, hours of Work of the employment of labor, nor to condone any violation of such laws, orders or regulations.

17.3. PAYROLL RECORDS

- 17.3.1. As required by Labor Code §§1700 *et seq.* (including but not limited to Labor Code §§1776 and 1812), and Title 8 of California Code of Regulations, the Contractor and every

Subcontractor, of any tier, shall keep accurate payroll records, 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 them in connection with the Work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating that the information contained in the payroll record is true and correct and that the Contractor or Subcontractor has complied with the requirements of §§1771, 1811, and 1815 for any work performed by its employees on the public works project.

17.3.2 The payroll records enumerated under Paragraph 17.3.1 shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor. A certified copy of employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative upon request.

17.3.3 Upon request by the District, the Division of Labor Standards Enforcement (DLSE), or the Division of Apprenticeship Standards of the Department of Industrial Relations, the payroll records of the Contractor, and every Subcontractor, of any tier, shall be available for inspection at all reasonable hours at the principal office of the Contractor or furnished to DIR, within 10 days of receipt of a written request. Failure to comply shall result in applicable penalties.

17.4. COOPERATION AND WITHHOLDING OF CONTRACT PAYMENTS

17.4.1. The Contractor, and every Subcontractor, of any tier, shall cooperate with the DIR, the Labor Commissioner, or DLSE in any investigation of suspected prevailing wage violations. The District shall likewise cooperate and shall withhold contract payments in accordance with any lawful order by DLSE.

17.5. HOURS OF WORK

17.5.1. As required by Labor Code §§1700 *et seq.* (including but not limited to Labor Code §1810), and Title 8 of California Code of Regulations, eight (8) hours of labor shall constitute a legal day's Work. Under Labor Code §1811, the time of service of any Worker employed at any time by the Contractor or by a Subcontractor, of any tier, upon the Work or upon any part of the Work, is limited and restricted to eight (8) hours during any one calendar day and forty (40) hours during any one calendar week, except as hereafter provided. Notwithstanding the foregoing provisions, under Labor Code §1815, Work performed by employees of Contractor or any Subcontractor, of any tier, in excess of 8 hours per day and 40 hours during any one week, shall be permitted upon compensation for all hours Worked in excess of 8 hours per day or 40 hours per week at not less than one and one-half (1½) times the basic rate of pay. Failure to comply with any of the foregoing shall result in applicable penalties.

17.5.2. Any Work performed by Workers necessary to be performed after regular Working hours or on Sundays or other holidays shall be performed without adjustment to the Contract Price or any other additional expense to the District.

17.6. APPRENTICES

17.6.1. It is the duty of the contractor and subcontractors to employ registered apprentices on the public works project and to comply with all aspects of Labor Code §1777.5, relating to Apprentices on Public Works. (1) Notify approved apprenticeship programs of contract award; (2) employ apprentices; (3) pay training fund contributions.

17.6.2 Under Labor Code §1777.5(e) the Contractor and all Subcontractors, of any tier, shall notify an approved training program that can supply apprentices to the area of the Public Works Project. All apprentices employed by the Contractor to perform any of the Work shall be paid the prevailing wages identified by the DIR. Only apprentices, as defined in Labor Code §3077 who are in training under apprenticeship standards and written apprenticeship

Agreements under Labor Code §§3070, *et seq.* are eligible to be employed for the Work. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice Agreements under which such apprentice is training or the Standards established by the Division of Apprenticeship Standards.

- 17.6.3. As required by Labor Code §§1700 *et seq.* (including but not limited to Labor Code §1777.5), and Title 8 of California Code of Regulations, the Contractor and any Subcontractor, of any tier, in performing any of the Work employs workers in any Apprenticeable Craft or Trade the Contractor and such Subcontractor shall apply to the Joint Apprenticeship Committee administering the apprenticeship standards of the craft or trade in the area of the site of the Work for a certificate approving the Contractor or such Subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected; provided, however, that the approval as established by the Joint Apprenticeship Committee or Committees shall be subject to the approval of the Administrator of the Division of Apprenticeship Standards. The Joint Apprenticeship Committee or Committees, subsequent to approving the Contractor or Subcontractor, shall arrange for the dispatch of apprentices to the Contractor or such Subcontractor in order to comply with Labor Code §1777.5. The Contractor and Subcontractors shall submit contract award information to the applicable Joint Apprenticeship Committee, which shall include an estimate of journeyman hours to be performed under the Contract, the number of apprentices to be employed, and the approximate dates the apprentices will be employed.
- 17.6.4 The ratio of work performed by apprentices to journeymen, who shall be employed in the Work, may be the ratio stipulated in the apprenticeship standards under which the Joint Apprenticeship Committee operates, but in no case shall the ratio be less than one hour (1) of apprentice Work for each five (5) hours of labor performed by a journeyman, except as otherwise provided in §1777.5. Any ratio shall apply during any day or portion of a day when any journeyman or the higher standard stipulated by the Joint Apprenticeship Committee, is employed at the site of the Work and shall be computed on the basis of the hours worked during the day by journeymen so employed, except for the land surveyor classification. The Contractor shall employ apprentices for the number of hours computed as above before the completion of the Work. The Contractor shall, however, endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the site of the Work. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of a Joint Apprenticeship Committee, may order a minimum ratio of not less than one apprentice for each five journeymen in a craft or trade classification. This Article shall not apply to Contracts of general Contractors, or to Contracts of Specialty Contractors not bidding for Work through a general or prime Contractor, involving less than Thirty Thousand Dollars (\$30,000).
- 17.6.5 The Contractor or any Subcontractor, of any tier, who performs any of the Work by employment of journeymen or apprentices in any Apprenticeable Craft or Trade and who is not contributing to a fund or funds to administer and conduct the apprenticeship program in any such craft or trade in the area of the site of the Work, to which fund or funds other Contractors in the area of the site of the Work are contributing, shall contribute to the fund or funds in each craft or trade in which it employs journeymen or apprentices in the same amount or upon the same basis and in the same manner as the other Contractors do, but where the trust fund administrators are unable to accept such funds, Contractors not signatory to the trust Agreement shall pay a like amount to the California Apprenticeship Council. The Contractors shall provide proof of such contributions when requested, including checks, check stubs, receipts, or other records required to prove that all required payments were made.
- 17.6.6. Failure to knowingly comply with any of the foregoing shall result in applicable penalties and in addition, upon determination by the Chief of Division of Apprenticeship Standards

under Labor Code §1777.7, the Contractor may be denied the right to bid on any public Works Contract for a period of one (1) year from the date the determination of non-compliance for the first violation and for a period of up to three years for a second or subsequent violation.

17.7. EMPLOYMENT OF INDEPENDENT CONTRACTORS

Pursuant to Labor Code §1021.5, Contractor shall not willingly and knowingly enter into any Agreement with any person, as an independent Contractor, to provide any services in connection with the Work where the services provided or to be provided requires that such person hold a valid Contractor's license issued pursuant to Business and Professions Code §§7000, *et seq.* and such person does not meet the burden of proof of his/her independent Contractor status pursuant to Labor Code §2750.5. In the event that Contractor shall employ any person in violation of the foregoing, Contractor shall be subject to the civil penalties under Labor Code §1021.5 and any other penalty provided by law. In addition to the penalties provided under Labor Code §1021.5, Contractor's violation of this Article 17.7 or the provisions of Labor Code §1021.5 shall be deemed an event of Contractor's default under Article 16.3 of these General Conditions. The Contractor shall require any Subcontractor, of any tier, performing or providing any portion of the Work to adhere to and comply with the provisions of this Article 17.7.

ARTICLE 18**18. MISCELLANEOUS****18.1. GOVERNING LAW**

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

18.2. MARGINAL HEADINGS; INTERPRETATION

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

18.3. SUCCESSORS AND ASSIGNS

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

18.4. CUMULATIVE RIGHTS AND REMEDIES; NO WAIVER

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

18.5. SEVERABILITY

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

18.6. NO ASSIGNMENT BY CONTRACTOR

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

18.7. GENDER AND NUMBER

18.7.1. Whenever the context of the Contract Documents so require, the neuter gender shall include the feminine and masculine, the masculine gender shall include the feminine and neuter, the singular number shall include the plural and the plural number shall include the singular.

18.8. INDEPENDENT CONTRACTOR STATUS

18.8.1. In performing its obligations under the Contract Documents, the Contractor shall be deemed an independent Contractor to the District and not an agent or employee of the District

18.9. NOTICES

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

18.9.2. If the notice is given to the surety or other person, by personal delivery to such surety or other person, or by depositing the same in the United States Mail, First Class Certified Return Receipt Requested, enclosed in a sealed envelope, addressed to such surety or person, at the address of such surety or person last communicated by him/her to the party giving the notice, postage prepaid and registered.

18.10. DISPUTES; CONTINUATION OF WORK

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

18.11. DISPUTE RESOLUTION.

18.11.1.[Reserved]

18.11.2. Definition of Claim. "Claim," as used herein, means a separate written demand or a separate written assertion by Contractor seeking (a) an extension of time, (b) the payment of money in a sum certain 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 the Claimant is not otherwise entitled to, or (c) an amount the payment of which is disputed by the District. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a Claim or dispute under the Contract. The voucher, invoice, or other request for payment may be converted to a Claim under the Contract, by complying with the submission requirements herein, if it is disputed either as to liability or amount. A written demand or assertion by a Contractor does not become a Claim under this Article until Contractor has received a written determination from Construction Manager under Article 10. If the Contractor fails to submit sufficient substantiating data in strict conformity with Article 10 and/or fails to provide notice in strict conformity with Articles 10.2 and 10.4.1.2, the Contractor shall waive any and all right to pursue any relief as to that Claim. However, the term "Claim" shall not include the following:

- 18.11.2.1. Claims regarding penalties for forfeitures prescribed by statute, or regulation, which a government agency is specifically authorized to administer, settle, or determine;
 - 18.11.2.2. Claims regarding personal injury, death, reimbursement, or other compensation arising out of or resulting from liability for personal injury or death;
 - 18.11.2.3. Claims regarding a latent defect, patent defect, breach of warranty, or guarantee to repair; or
 - 18.11.2.4. Claims regarding stop payment notices.
- 18.11.3. Written Notice of Claim and Request for Meet and Confer Required. If the Contractor disagrees with the Construction Manager's written determination pursuant to Article 10 and intends to further pursue the subject Claim, the Contractor must request in writing the following two items: 1) an executive negotiation session ("Meet and Confer") and pursuant to Public Contract §20104 *et seq.* with the office of the Construction Management Director; and 2) a respective written decision ("Written Decision").
- 18.11.4. Good Faith Attempt to Resolve. The Contractor and District shall make good faith attempts to resolve any and all Claims that may from time to time arise during the performance of the Work covered by this Contract. Notwithstanding the provisions of Public Contract Code §20104, *etc. seq.*, the procedures for dispute resolution set forth therein shall not be commenced until after a dispute subject to resolution under the §20104 procedures has been submitted to Meet and Confer. Pursuant to the Contractor's written request for a Meet and Confer, the District's Construction Management Director or his or her designee will schedule the meeting within a reasonable time, consult with the Supervising Project Manager and the Construction Manager, and issue a Written Decision within ten (10) days of the Meet and Confer, unless action or response by the Contractor to provide additional supporting documentation is required.
- 18.11.5. Written Formal Claim Required. If the Contractor disagrees with the Written Decision from the District, and the Contractor intends to submit a Claim as provided for in Article 18.11.2, the Contractor shall submit its Claim in writing to the Construction Manager in strict conformity with the Claim format set forth below within thirty (30) days of date of Written Decision. Contractor's failure to provide all justifying documentation within thirty (30) days of date of Written Decision shall waive any and all right to pursue any relief as to that Claim.
- 18.11.6. Claim Format. The Contractor (and Subcontractor(s), if the Contractor is submitting the Claim on its/their behalf) shall submit the Claim justification in the following format:
- a. Cover letter containing a statement that it is a Claim, and a summary description of the Claim, amount of the Claim, and clause or section under the Contract under which the Claim is made.
 - b. Copies of documents relating to the Claim as attachments:
 - 1) Specifications
 - 2) Drawings
 - 3) Clarifications (RFI's)
 - 4) Correspondence
 - 5) Other relevant information

- c. Chronology of events
 - d. Detailed analysis of Claim merit
 - e. Time Impact Analysis pursuant to Article 6
 - f. Detailed analysis of Claim cost
 - g. Certification
- 18.11.7. Certification: The Contractor (and Subcontractor(s), if the Contractor is submitting the Claim on its/their behalf) shall submit with the Claim a certification that:
- a. The Claim is made in good faith;
 - b. Supporting data are accurate and complete to the best of the Contractor's knowledge and belief; and
 - c. The amount requested accurately reflects the Contract adjustment for which the Contractor believes the District is liable.
- 18.11.8. The certification shall contain the following statement: "I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct." Said declaration shall be dated and signed by an authorized person. If the Contractor is not an individual, the certification shall be executed by an officer or general partner of the Contractor having overall responsibility for the Contractor's business affairs.
- 18.11.9. Failure to provide the certification in accordance with the above requirements will result in the Contractor's waiver of any and all right to pursue the subject Claim.
- 18.11.10. If a false, claim is submitted (as defined under the False Claims Act found in California Government Code §§12650 *et seq.*) it will be considered fraudulent and the Contractor may be subject to criminal prosecution under California Penal Code §72 and/or civil liability under False Claims Act. In such case, the District shall be entitled to recover all costs incurred to investigate any False Claim, including but not limited to attorneys' fees and expert fees incurred in connection with said investigation.
- 18.11.11. Formal Claim Review and Determination: Upon receipt of a Claim, the District shall review the Claim and, within a period not to exceed forty-five (45) days, shall provide 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 the Contractor may, by mutual written agreement, extend the forty-five (45) day time period. The District shall process and make payment of any undisputed portion of a Claim within sixty (60) days after the District issues its written statement. Failure by the District to provide a written statement in response to a Claim from the Contractor within the forty-five (45) day time period, or within an agreed upon extended time period, shall result in the Claim being deemed rejected in its entirety. A Claim that is rejected by reason of the District's failure to respond, or failure to timely respond, to the Claim shall not constitute an adverse finding regarding the merits of the Claim or the claimant's responsibility or qualifications. Contractor agrees that strict compliance with Articles 6, 10, and 18 is an express condition precedent to Contractor's right to litigate a Claim. Contractor specifically agrees to assert no Claims in litigation unless there has been strict compliance with Articles 6, 10, and 18.
- 18.11.12. Meet and Confer Meeting. If the Contractor disputes the District's written response, or if the District fails to respond within the time frame prescribed above, the Contractor, within fifteen (15) days of the District's written response or, if the District fails to respond, within fifteen (15) days after the District's response was due, may demand, in a writing sent to the District's Construction Manager by registered mail or certified mail, return receipt requested, with a copy to the Project Manager, an informal conference to meet and

confer for settlement of the issues in dispute. The District shall schedule a meet and confer conference within thirty (30) days of its receipt of the Contractor's written demand.

- 18.11.13. Mediation. 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. 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. Any disputed portion of the Claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation. The expenses and fees of the mediator and the administrative fees shall be divided among the parties equally. Each party shall pay its own legal fees, witness fees, and other expenses. The District and the 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.

At the District's sole discretion, this mediation may be a multiple-party mediation with the Architect, the Construction Manager, the Inspector, and/or other District consultants.

- 18.11.14. Post Mediation.

Claims of \$375,000 or Less: Claims between the District and the Contractor of \$375,000 or less shall be resolved in accordance with the procedures established in California Public Contract Code §§20104, *et seq.*; provided, however that California Public Contract Code §20104.2(a) shall not supersede the requirements of the Contract Documents with respect to the Contractor's notification to the District of such Claim or extend the time for the giving of such notice as provided in the Contract Documents.

Litigation of Claims in Excess of \$375,000: If, after a mediation as indicated above, the Parties have not resolved the Claim, either Party may commence an action in a court of competent jurisdiction to contest that decision within ninety (90) days following the conclusion of that mediation or one (1) year following the accrual of the cause of action, whichever is later. By mutual agreement, the Parties can agree to instead resolve the Claim through arbitration.

- 18.11.15. Contractor's Obligation to File a Government Code Claim. Nothing in this Contract, including this Claims Resolution Process, waives, modifies, or tolls the Contractor's obligation to present a timely claim under Government Code section 910, *et seq.* Therefore, in addition to complying with this Claims Resolution Process, the Contractor is required to present Government Code claims to the District pursuant to Government Code section 910, *et seq.* If after the requirements of this Claims Resolution Process are satisfied, and all or a portion of the Claim remains unresolved, and if the Government Code claim is rejected by the District, the Contractor may proceed under the post-mediation provisions of this Claims Resolution Process.

- 18.11.16. Subcontractors.

Public Contract Code section 9204(d)(5) states that 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 the Contractor present a claim for Work which was performed by the Subcontractor or by a lower tier Subcontractor on behalf of the Subcontractor. The Subcontractor requesting that the Claim be presented to the District shall furnish reasonable documentation to support the Claim. Within 45 days of receipt of this written request, the Contractor shall notify the Subcontractor in writing as to whether the

Contractor presented the claim to the District and, if the Contractor did not present the Claim, provide the Subcontractor with a statement of the reasons for not having done so.

Contractor is responsible for providing this Dispute Resolution Process to its Subcontractors and for ensuring that all Subcontractors or others who may assert Claims by and through Subcontractors and/or the Contractor are informed of this Dispute Resolution Process. No Claim submitted by any party that fails to follow the provisions of this Dispute Resolution Process will be considered. Contractor shall bind all its Subcontractors to this Dispute Resolution Process and indemnify, keep and hold harmless the District and its consultants, against all suits, claims, damages, losses, and expenses, including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to, the failure to provide this Dispute Resolution Process to its Subcontractors or others who may assert Claims by and through Subcontractors and/or the Contractor.

ARTICLE 19**19. CONFLICTS IN CONTRACT DOCUMENTS****19.1. ARCHITECT'S RESOLUTION**

- 19.1.1. Conflicts, inconsistencies or ambiguities in the Contract Documents shall be resolved by the Architect, in consultation with the District, in accordance with Article 3.1.7. of the General Conditions.

19.2. INTERPRETATION OF CONTRACT DOCUMENTS

- 19.2.1. The Contract Documents are complementary and what is required by one part shall be as binding as if required by all unless one or more parts are in conflict with each other. When there are conflicts, Article 19.2.2. of the General Conditions applies. Where any portion of the Contract Documents is silent and information appears elsewhere in the Contract Documents, such other portions of the Contract Documents shall control.

- 19.2.2. Where conflicts or inconsistencies arise in the Contract Documents, the conflict shall first be resolved by giving precedence to the most recently amended version of the document and in the following order, and if that does not resolve the conflict, by complying with the most stringent requirement:

- Change Orders in reverse order of issuance, issued by the District after receipt of approval of the plans and Specifications from the State of California, Division of State Architect.
- Plans and Specifications approved by the Division of State Architect, limited, however, to the extent that approval relates to the safety of design and construction.
- Executed Agreement.
- Supplementary Conditions.
- General Conditions.
- Construction Documents - Technical Specifications Division 01.
- Construction Documents - Technical Specifications Divisions 02 - 34.
- Construction Documents - Drawings and Exhibits, with figured dimensions controlling over scaled measurements.

END OF GENERAL CONDITIONS - EXHIBITS FOLLOW

Exhibit "A"

Payment – Extra, Additional, Deleted Work, or Allowances

PROJECT NAME:

CHANGE DESCRIPTION:

DATE:

PAYMENT	EXTRA/ADDITIONAL/ DELETED WORK/ ALLOWANCES
1. <u>General Contractor Material and Equipment</u> a. Attach itemized quantity and unit cost plus sales tax. b. Include information where derived, i.e., "RSMeans Building Construction Cost Data" or other source mutually agreed to by all parties.	
2. <u>General Contractor Labor</u> Attach itemized hours and rates per certified payrolls, prevailing wage chart and PSA agreements. Rates shall only include a maximum of 15% for payroll burden plus actual costs for Workers' Compensation Insurance. Payment for extra supervision will be paid when extra Work is done in a time period other than normal Working hours.	
3. Subtotal: Item #1 plus Item #2	
4. <u>General Contractor's Overhead, Profit, Supervision, Bond Fees</u> (A maximum aggregate total of 16% of Item #3.) <u>For Allowances, mark ups shall be determined at the time of use.</u> <u>This item is not allowed on Extended Overhead.</u>	
5. Total General Contractor: Item #3 plus Item #4	
6. <u>Subcontractor Material and Equipment</u> a. Attach itemized quantity and unit cost plus sales tax. b. Include information where derived, i.e., "RSMeans Building Construction Cost Data" or other source mutually agreed to by all parties.	
7. <u>Subcontractor Labor</u> Attach itemized hours and rates per certified payrolls, prevailing wage chart, and PSA agreements. Rates shall only include a maximum of 15% for payroll burden plus actual costs for Workers' Compensation Insurance. Payment for extra supervision will be paid when extra Work is done in a time period other than normal Working hours.	
8. Subtotal: Item #6 plus Item #7	
9. <u>General Contractors' Overhead, Supervision, Bond Fees and Profit for Subcontractor Work</u> (A maximum aggregate total of 11% of Item #8.) <u>For Allowances, mark ups shall be determined at the time of use.</u> <u>This item is not allowed on Extended Overhead.</u>	
10. <u>Subcontractor's Overhead and Profit</u>	

Maximum aggregate total of 15% of Item #8. Not to be included for Work provided by Contractor. No sub-tier markups allowed. Attach signed Subcontractor documentation on Subcontractor letterhead. <u>This item is not allowed on Extended Overhead.</u>	
11. Subtotal: Item #9 plus Item #10.	
TOTAL: Item #5 plus Item #8 plus Item #11.	

EXTRA OR CREDIT CHANGE ORDERS WILL NOT BE CONSIDERED UNLESS THIS EXHIBIT IS COMPLETELY FILLED IN WITH ALL ADDS AND DEDUCTS ACCOUNTED FOR ALONG WITH APPROPRIATE BACKUP DOCUMENTATION. ANY SPACES LEFT BLANK WILL BE DEEMED NO CHANGE TO COST OR TIME.

Cost summaries, breakdowns, back-up or requests shall not be based, in whole or in part, upon any methodology (such as "total cost", "modified total cost" or "Eichleay" formulaic methodologies) that purports to calculate or estimate additional costs of performance of the extra, additional or disputed Work (including, without limitation, the additional costs of delay, disruption, interference, hindrance, unabsorbed overhead, or other impacts) and the cumulative impact of each extra, additional, or deleted Work on other parts of the Work.

Attachment 1A, Hourly Labor Rate Worksheet must accompany all change orders or allowances.



ATTACHMENT 1 A

This form **MUST** be utilized in conjunction with ATTACHMENT 1 / EXHIBIT A for
ALL change orders, allowances and contractor contingencies.

SAN DIEGO UNIFIED SCHOOL DISTRICT
Facilities Planning Construction
4850 Ruffner Street
San Diego, California 92111-1522

CONTRACT NAME: _____
CONTRACTOR/SUBCONTRACTOR: _____
GENERAL WAGE DETERMINATION: _____

SDUSD CONTRACT NO. _____
UNIFIER P.O. NO. _____
DATE _____

HOURLY LABOR RATE WORKSHEET

Contractor **MUST** enter information in all fields (Excel spreadsheet may be requested). The District's Excel spreadsheet automatically populates the shaded areas below).

CRAFT/TRADE: _____ GROUP NO.: _____ CLASSIFICATION: Apprentice Period Level _____ or Journeyman
(circle applicable)

Item		Prevailing Wage Rate			Notes
		Regular Time	Overtime	Double Time	
(1) Base Labor Rate		\$ -	\$ -	\$ -	
	Paid to Worker				
	Paid to Plan/Union				
Fringe Benefits: ¹		(enter rate in appropriate box)			
Health & Welfare ²	\$ - \$ -	\$ -	\$ -	\$ -	
Pension ²	\$ - \$ -	\$ -	\$ -	\$ -	
Vacation ^{2 & 3}	\$ - \$ -	\$ -	\$ -	\$ -	
Training ²	\$ - \$ -	\$ -	\$ -	\$ -	
Other ² (provide description in "Notes")	\$ - \$ -	\$ -	\$ -	\$ -	
Supplemental Dues ² (does not apply to all crafts/trades, please refer to the DIR General Wage Determination for applicability or not)	\$ - \$ -	\$ -	\$ -	\$ -	
	(2a) Total Paid to Worker				
	(2b) Total Paid to Plan/Union				
Fringe Benefits Totals		\$ -	\$ -	\$ -	
(2) Fringe Benefits Subtotal (includes both paid to worker & paid to plan/union)		\$ -	\$ -	\$ -	
Travel & Subsistence:		(Fringe Benefit Subtotal that exceeds DIR's total maximum fringes, <u>will</u> <u>not</u> receive credit for the difference)			
Travel (refer to DIR General Wage Determination for applicability or not)		\$ -			
Subsistence (refer to DIR General Wage Determination for applicability or not)		\$ -			
(3) Travel & Subsistence Subtotal		\$ -			
Total Paid Hourly Rate to Worker ⁴ (includes line items #1, #2a & #3)		\$ -	\$ -	\$ -	= Hourly Rate Paid to Worker on his/her check
Burden: Taxes & Insurance		BURDEN BASED ON ABOVE RATES			
	% Rates				
Social Security (FICA)	\$ -	\$ -	\$ -	\$ -	
Medicare (FICA)	\$ -	\$ -	\$ -	\$ -	
Federal Unemployment Insurance (FUTA)	\$ -	\$ -	\$ -	\$ -	
California Unemployment Insurance (UI)	\$ -	\$ -	\$ -	\$ -	
Employment Training Tax (ETT)	\$ -	\$ -	\$ -	\$ -	
Payroll Burden (can not exceed 15%)					
Workers' Compensation Code: _____	\$ -	\$ -	\$ -	\$ -	
(4) Burden Subtotal		\$ -	\$ -	\$ -	
Contractor Liability Insurance		n/a	n/a	n/a	Included in OH&P per CGC
Small Tools		n/a	n/a	n/a	Included in OH&P per CGC
Other (warranty, record drawings, payment & performance bonds, etc.)		n/a	n/a	n/a	Included in OH&P per CGC
Union Dues		n/a	n/a	n/a	Included in OH&P per CGC
TOTAL HOURLY RATE (includes line item #1, #2, #3 & #4)		\$ -	\$ -	\$ -	= \$ Contractor/Subcontractor paid to worker. ALL fringes, plus burden

¹ Hourly rate for each fringe paid to a bona fide plan/program/union or if paid to the worker must be indicated. Any fringes paid to worker become cash fringes.

² Fringe rates for overtime and double time are the same as regular rate of pay.

³ If paid vacation is added to gross wages, for tax purposes, and then deducted for payment at a later time. Rate must be entered under "Paid to Worker."

⁴ Taxes & Insurance apply to the Total Paid Hourly Rate which includes Base Labor Rate plus ANY fringe benefits paid to worker. PSA projects ALL fringes paid to a plan.

By signing below, the submitter certifies and declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Name & Title: _____
(print name)

Company Name: _____

Signature: _____

Rev 03.11.2024

Exhibit "B"
CONTRACTOR AND SUBCONTRACTOR MONTHLY UPDATE OF EMPLOYEE D.O.J.
FINGERPRINTING STATUS

The following is a list of our employees and our subcontractor's employees and their DOJ fingerprinting status who are working on the project site(s). I will keep this list current and send the District's Construction Manager any new updates with my monthly payment application.

<u>NAME</u>	<u>EMPLOYER</u>	<u>FINGERPRINTED?</u>	
		Yes	No
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
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_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Contact Name (Officer or Employee)


Title

Authorized Signature

Telephone Number

Exhibit "C"

Final Subcontractors List as required by Labor Code Section 1773.3(d)

 FINAL SUBCONTRACTORS LIST Subcontractors List as required under Labor Code Section 1773.3(d)											
General Contractor:								SDUSD Agreement / PO No:			
Contract Name:											
Contract Site Address:											
Instructions: Enter Subcontractor 1st & Record SubTier(s) below Subcontractor to associate sub responsible.											
CHECK APPROPRIATE BOX			PLEASE SIGN & DATE BELOW								
	Listed Sub performed over 1/2%	Direct Sub performed less than 1/2%	Sub-Tier	Subcontractor/ Sub-Tier Name	Contact Email Address	Contact Number	Subtier to Sub	DIR Compliance Email Address	DIR Registration No.	CSLB No.	Work Classification (i.e. craft/trade) Used for Project
EX	X			Sample: Baker Electric	jr@baker.com	(619) 555-2222	~	accounting@baker-electric.com	1000000466	161756	Electrician
EX			X	Sample Tier: Power Plus I	gw@baker.com	(858) 555-3023					
					gk@PP.com	(760) 555-6565	Baker Electric	bfine@powerplus.com	1000624421	980589	
					BF@PP.com	(916) 555-4444					
1											
2											
3											
4											
5											
6											
7											
8											
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10											
11											
12											
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14											
15											
16											
17											
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19											
20											
21											
22											
23											
24											
25											

Name & Title

Date

Signature

1. INDEMNITY

- A. Unless arising solely out of the active negligence, gross negligence or willful misconduct of the Indemnified Parties, the Contractor shall indemnify, defend and hold harmless (i) the District, its Board of Education members, officers, employees, agents and representatives (including the District's Project Inspector, Construction Manager and Project Manager); (hereinafter collectively referred to as the "Indemnified Parties") from and against any and all damages, losses, claims, demands or liabilities of any kind or nature whatsoever, which arise from, or are alleged to arise from, or are in any way connected to, in whole or in part, the Work, the Contract Documents or the acts, omissions or other conduct of the Contractor or any Subcontractor or any person or entity engaged by them in connection with the Work. The Contractor's obligations under the foregoing include without limitation: (i) injuries to or death of persons; (ii) damage to property; or (iii) theft or loss of property; (iv) stop payment notice Claims asserted by any person or entity in connection with the Work; and (v) other losses, liabilities, damages or costs resulting from, in whole or part, any acts, omissions or other conduct of the Contractor, any Subcontractor, of any tier, or any other person or entity employed directly or indirectly by Contractor in connection with the Work and their respective agents, officers or employees, and (vi) other losses, liabilities, damages or costs resulting from, in whole or part, any acts, omissions or other conduct of the Contractor, any Subcontractor, of any tier, or any other person or entity employed directly or indirectly by Contractor in connection with the Work and their respective agents, officers or employees. Contractor's obligations hereunder shall include the obligation to defend, indemnify and hold harmless the Indemnified Parties from and against any and all claims asserted, or liability established, for damages or injuries to any person or property which may arise from, or are connected with, or are caused, or claimed to be caused, by the contractor's failure to comply with all of the requirements contained in Education Code, section 45125.1, including, but not limited to, the requirement prohibiting the contractor from using employees who may have contact with pupils who have been convicted of, or have charges pending for, a felony as defined in Education Code 45125.1.
- B. If any action or proceeding, whether judicial, administrative, arbitration or otherwise, shall be commenced on account of any claim, demand or liability covered by this, and such action or proceeding names any of the Indemnified Parties as a party thereto, the Contractor shall, at its sole cost and expense, defend the Indemnified Parties in such action or proceeding with counsel reasonably satisfactory to the Indemnified Parties named in such action or proceeding.
- C. In the event that there shall be any judgment, award, ruling, settlement, or other relief arising out of any such action or proceeding to which any of the Indemnified Parties are bound by, Contractor shall pay, satisfy or otherwise discharge any such judgment, award, ruling, settlement or relief; Contractor shall indemnify and hold harmless the Indemnified Parties from any and all liability or responsibility arising out of any such judgment, award, ruling, settlement or relief. The Contractor's obligations hereunder are binding upon Contractor's Performance Bond Surety and these obligations shall survive notwithstanding Contractor's completion of the Work or the termination of the Contract.

2. INSURANCE**A. Contractor's Insurance**

Contractor shall procure and maintain for the duration of the contract and warranty period insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, his agents, representatives, employees or subcontractors.

B. Minimum Scope of Insurance

1. Coverage shall be at least as broad as:
 - a. Insurance Services Office (ISO) Commercial General Liability coverage (occurrence Form CG 00 01) or Insurance Services Office Form (CG 00 09 11 88 Owners and Contractors Protective Liability Coverage Form – Coverage for Operations of Designated Contractor.
 - b. Insurance Services Office Form Number CA 0001 covering Automobile Liability, Code 1 (any auto).
 - c. Workers' Compensation insurance as required by the State of California and Employers' Liability insurance.
 - d. Surety bonds as described below.
 - e. Contractors' Pollution Legal Liability and/or Asbestos Legal Liability (if project involves potential pollution issues)

C. Minimum Limits of Insurance

1. General Liability: (Including operations, products and completed operations)
 - a. **\$2,000,000** per occurrence (if construction estimate is under five million dollars) or **\$3,000,000** per occurrence (if construction estimate is equal to or over five million dollars) for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the **general aggregate limit shall be twice the required occurrence limit.**
2. Automobile Liability:
 - a. **\$1,000,000** per accident (if construction estimate is under five million dollars) or **\$2,000,000** per accident (if construction estimate is equal to or over five million dollars) for bodily injury and property damage.
3. Workers Compensation Insurance:
 - a. As required by the State of California.
4. Employers Liability Insurance:
 - a. **\$1,000,000** each accident, **\$1,000,000** policy limit bodily injury by disease, **\$1,000,000** each employee bodily injury by disease.
5. Property Installation Floater:
 - a. **50% of Contract Price.**
6. ~~Pollution Legal Liability and/or Asbestos Legal Liability:~~
 - a. ~~**\$1,000,000.**~~

D. Deductibles and Self-Insured Retentions

1. Any deductibles or self-insured retentions shall not be for more than \$100,000 and must be declared to and approved by the District. At the option of the District, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the District, its officers, officials, employees and volunteers; or the Contractor shall provide a financial guarantee in the form of a bond satisfactory to the District guaranteeing payment of losses and related investigations, claim administration and defense expenses. Contractor shall be solely and exclusively responsible for the payment of any deductibles, under the

required policies of insurance, without adjustment to the Contract Price on account thereof.

E. Other Insurance Provisions

1. The General Liability and Automobile Liability policies are to contain, or be endorsed to contain, the following provisions:
 - a. The District, its officers, officials, employees, and volunteers are to be covered as insureds ("additional insureds") with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Contractor; and with respect to liability arising out of work or operations performed by on behalf of the Contractor including materials, parts or equipment furnished in connection with such work or operations. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance, or as a separate owner's policy.
 - b. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance in respect to the District, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the District, its officers, officials, employees, or volunteers shall be in excess of the Contractor's insurance and shall not contribute with it.
 - c. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be cancelled by either party, except after thirty (30) days prior written notice has been provided to the District.

F. Property Installation Floater in lieu of Builder's Risk Insurance

1. Contractor will purchase and maintain Property Installation Floater for 50% of the Contract Price. The Property Installation Floater shall provide property damage coverage for any building, structure, machinery or equipment damaged, impaired, broken or destroyed during the performance of the Work, including during transit, installation and testing at the District's site. The property Installation Floater coverage ceases upon completion of the Work, or portions of the Work, at the Project Site as documented by a Certificate of Substantial Completion from the District. However, a grace period of thirty (30) days of additional coverage (punch period) will be expended should Contractor be required to return to perform. Work on Site directly and solely related to the completion of the Contract.

G. Claims Made/Pollution Legal Liability

1. If General Liability, Contractor's Pollution Liability and/or Asbestos Pollution Liability and/or Errors & Omissions coverages are written on a claims-made form.
 - a. The retroactive date must be shown and must be before the date of the contract or the beginning of contract work.
 - b. Insurance must be maintained and evidence of insurance must be provided for at least five (5) years after completion of contract work.
 - c. If coverage is cancelled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the contract effective date, the Contractor must purchase extended reporting period coverage for a minimum for five (5) years after completion of contract work.
 - d. A copy of the claims reporting requirements must be submitted to the District for review.
 - e. If the services involve lead-based paint or asbestos identification/remediation, the Contractor's Pollution Liability policy shall

not contain lead-based paint or asbestos exclusions. If the services involve mold identification/remediation, the Contractors Pollution Liability policy shall not contain a mold exclusion, and the definition of Pollution shall include microbial matter, including mold.

H. Acceptability of Insurers

1. Insurance is to be placed with insurers with a current A.M. Best rating of no less than A:VII, unless otherwise acceptable to the District, and authorized to do business in the State of California. Exception may be made for the State Compensation Insurance Fund when not specifically rated. Coverage provided by non-admitted surplus lines carriers may be accepted provided the insurers are included in the current California LASLI list and otherwise meet rating requirements.

I. Verification of Coverage

1. Contractor shall furnish the District with endorsements effecting coverage required by this clause. The endorsements are to be signed by a person authorized by the Insurer to bind coverage on its behalf. All endorsements are to be received and approved by the District before work commences. However, failure to do so shall not operate as a waiver of these insurance requirements. The Contractor's insurer shall provide complete copies of all required insurance policies, including endorsements affecting the coverage required by these specifications.

J. Waiver of Subrogation

1. Contractor hereby agrees to waive subrogation rights which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. Contractor agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation. The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the District for all work performed by the Contractor, its employees, agents and subcontractors.

K. Subcontractors

1. Contractor shall require and verify that all listed subcontractors maintain minimum General Liability limits of \$1,000,000 per occurrence / \$2,000,000 in the aggregate, thereby meeting all the requirements stated herein. Limits required by Tier I subcontractors may only be modified with the written consent of the District. A Tier I subcontractor is defined as a subcontractor having a direct contract with the Contractor (as opposed to a sub-tier contractor).

L. Maintenance of Insurance

1. Any insurance, including Claims made policies bearing on the adequacy of performance of Work, shall be maintained after the District's Final Acceptance of all the Work, or from the date of Substantial Completion as provided in Article 15.2.2 of the General Conditions, for the full two years correction of Work period and any longer specific guarantee or warranty periods set forth in the Contract Documents. Should such insurance be canceled before the end of such periods and the Contractor fails to immediately procure replacement insurance as specified, the District reserves the right to procure such insurance and to charge the cost thereof to the Contractor. Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's defense and indemnity obligations or responsibility for payment of damages from its

operations or performance of the Work under the Contract Documents, including without limitation the Contractor's obligation to pay liquidated damages. In no instance shall the District's exercise of its option to occupy and use completed portions of the Work relieve the Contractor of its obligation to maintain insurance required under this Article until the date of Final Acceptance of the Work by the District, or such time thereafter as required by the Contract Documents. The insurer providing any insurance coverage required hereunder shall be to the reasonable satisfaction of the District.

M. Surety Bonds

1. All surety bonds shall be duly executed by a responsible corporate surety with a current A.M. Best rating of no less than A-:VII, unless otherwise acceptable to the District, authorized to issue such bonds in the State of California and secured through an authorized agent with an office in California. Exception may be made for the State Compensation Insurance Fund when not specifically rated. Coverage provided by non-admitted surplus lines carriers may be accepted provided the insurers are included in the current California LASLI list and otherwise meet rating requirements.
 - a. A Bid Bond, certified or cashier's check for ten percent (10%) of the Bidder's offer, to be included with submitted bid documents at time of bid.
 - b. A Performance Bond for one hundred percent (100%) of the Contract Price. Said Performance Bond shall be on the form provided in the bid documents herein.
 - c. A Labor and Material Payment Bond for one hundred percent (100%) of the Contract Price. Said Payment Bond shall be on the form provided in the bid documents herein.
2. The failure or refusal of the Contractor to furnish either the Performance or the Labor and Material Payment Bond in strict conformity with this Article may be deemed by the District as a default by the Contractor of a material obligation hereunder.

3. DISTRICT REPRESENTATIVE

The District Representative for all work will be the Construction Manager which will be assigned at a later date by the Construction Management department, 4860 Ruffner Street, San Diego, CA 92111-1522.

4. HAZARDOUS MATERIALS TRAINING

Prior to commencing work, the Contractor shall provide training for all applicable Contractor employees regarding all Hazardous Substances with which the Contractor's employees may encounter during the course of the contract. The District's Safety Coordinator shall provide the substance inventory, if any, to the Contractor, for the work area involved, prior to the Contractor's employees beginning work on District premises. Contractor shall provide the District's Representative with appropriate documentation evidencing that Contractor's employees have received the appropriate hazardous materials training and information.

5. EMPLOYEE FINGERPRINT VERIFICATION; BARRIERS; EMPLOYEE SURVEILLANCE

- A. At all times when a Site is used or occupied for academic purposes or for other school related functions, no employee or independent contractor to the Contractor or any

Subcontractor shall be permitted access to the Site or to perform any Work at the Site unless: (a) such person has submitted her/his fingerprints to the California Department of Justice ("DOJ") pursuant to Education Code §45125.1; (b) the DOJ has ascertained, based upon the submitted fingerprints, that the individual has not been convicted of a felony defined in Education Code §45122.1 and has no criminal felony proceedings (as defined in Education Code §45122.1) pending against her/him; (c) the Contractor or Subcontractor engaging the individual for the Work has received written or electronic verification from the DOJ of the absence of felony convictions and pending felony criminal proceedings; and (d) the Contractor or Subcontractor engaging such individual as an employee or independent contractor has submitted a Fingerprint Certification to the District specifically identifying such individual as having been verified by the DOJ as not having been convicted of a felony and not having pending criminal felony proceeding pending against her/him. The provisions of Education Code §45125.2(a) notwithstanding, erection and maintenance of physical barriers and/or continuous supervision and monitoring are insufficient measures to comply with the requirements of this paragraph when a Site is being used or occupied for academic purposes or other school related functions. At all other times during the Work, as appropriate, or as directed by the District, to limit contact between workers performing the Work and students and for the safety of students, the Contractor shall: (i) erect a physical barrier around the Work to limit contact between students and the individuals performing Work; or (ii) designate an employee of the Contractor and require each Subcontractor to designate an employee who shall be responsible for the continuous monitoring and supervision of the other employees of the Contractor and Subcontractors, provided that the employees designated for such monitoring and supervision has submitted her/his fingerprints to the Department of Justice under Education Code §45125.1 for verification that she/he has not been convicted of a felony and does not have any criminal proceeding pending against her/him and the Contractor/Subcontractor employee has submitted a Fingerprint Certification attesting to such Department of Justice fingerprint verification and the absence of criminal convictions or pending criminal proceedings. The responsibility for complying with the requirements of Education Code §45125.2 rests solely with the Contractor; the District will not designate any District personnel for surveillance of the Contractor's employees under Education Code §45125.2(a)(3).

- B. In accordance with General Conditions section 7.2 PROGRESS PAYMENTS, Contractor must submit an updated list (see Exhibit C of the General Conditions) of all Contractor's and his Subcontractor's employees with their DOJ fingerprinting status with their monthly payment application. Failure to include the list with their monthly payment application will be reason to reject the application and delay of payment until the payment application has been submitted as required and accepted by the District.
- C. At time of bid, if Contractor checks box 3) on the "Contractor Certification Regarding Background Checks" form stating he will execute the required Department of Justice application and send the required employees to be fingerprinted, Contractor must provide certification with his first payment application that the required employees were indeed fingerprinted. Failure to provide certification will result in delay of payment until such certification is provided to the project's Construction Manager.
- D. Contact www.oag.ca.gov to obtain an ORI number or more information from the Department of Justice regarding this requirement.

6. PROJECT STARTING AND COMPLETION DATES – CONTRACT TIME

Construction for the project shall start per Notice to Proceed (NTP), which is incorporated by reference into the contract, shall progress continuously, and be substantially completed no later than November 14, 2025.

7. STANDARD AND MODIFIED WORK WEEK

A standard work week is defined as Monday through Friday. A standard work day is defined as eight (8) hours worked between the hours of 7:00 a.m. and 7:00 p.m. during a standard work week, as defined in California Labor Code sections 1810 through 1815.

In order to minimize disruption to the teaching environment, the Contractor may be required, at the District's discretion, to have his employees work a modified work week. A modified work week is defined as any forty (40) hour week *other than a standard work week*.

If the Contractor is required to work a modified work week, the work will be performed at *straight time*. No overtime compensation will be authorized, or paid, by the District for a modified work week schedule. See section 17.5.2 of the General Conditions.

8. LOCATOR SERVICES

The Contractor is responsible for locating all existing utility lines on the work site prior to beginning work, and shall not rely on District provided drawings for their location. In addition, the Contractor is responsible for the procurement and payment of any and all locator services necessary to locate existing utility lines.

9. INVOICES / PAYMENT APPLICATIONS

Original invoices / payment applications shall be submitted to:

San Diego Unified School District
Physical Plant Operations Center
Attn: Charles Treichler
4860 Ruffner Street
San Diego, CA 92111-1522

Each invoice/progress payment request must reference the assigned bid/contract number, school name(s), project description, and name of District representative.

In the event that adjustments are made to the progress payment request, due to stop notices, Labor Compliance issues or backcharges, the Contractor must re-invoice for the amounts deducted.

Contractor must invoice for his retention at the end of the project in order for the release of retention funds to occur.

Pursuant to Labor Code §1773.3, District shall withhold final payment due to the Contractor until at least 30 days after all of the required information in paragraph (2) of subdivision (a) has been submitted, including, but not limited to, providing a complete list of all subcontractors.

10. POST AWARD CONTRACT ADMINISTRATION

All post award correspondence, including requests for subcontractor substitutions, preliminary notices and insurance renewals and updates shall be sent to:

San Diego Unified School District
Contracts Compliance Office
Attn: Mayra Flores, Senior Contract Specialist
4860 Ruffner Street
San Diego, CA 92111
PH: 858-637-6248
FAX: 858-496-1953

11. LIQUIDATED DAMAGES

Pursuant to Article 6.7 of the General Conditions, the amount of liquidated damages to be paid by the Contractor to the District for failure to complete the work specified will be according to the following scale for each calendar day by which completion is delayed beyond the Substantial Completion Date:

Total Contract Amount Range	Liquidated Damages per days of Non completion
\$10,000 to \$199,999	\$500
\$200,000 to \$499,999	\$625
\$500,000 to \$1,499,999	\$750
\$1,500,000 to \$2,999,999	\$1,250
\$3,000,000 to \$4,999,999	\$1,500
\$5,000,000 to \$9,999,999	\$2,000
\$10,000,000 to \$19,999,999	\$3,000
\$20,000,000 to \$29,999,999	\$3,500
\$30,000,000 to \$39,999,999	\$4,000
\$40,000,000 to \$49,999,999	\$4,500
\$50,000,000 to \$59,999,999	\$5,000
\$60,000,000 to \$69,999,999	\$5,500
\$70,000,000 to \$79,999,999	\$6,000
\$80,000,000 to \$89,999,999	\$6,500
\$90,000,000 to \$99,999,999	\$7,000
\$100,000,000 +	\$7,500

Any money due or to become due the Contractor may be retained to cover said liquidated damages. Should such money not be sufficient to cover said liquidated damages, the District shall have the right to recover the balance from the Contractor or his sureties, who will pay said balance forthwith for each calendar day of delay until the work is completed and accepted, and the Contractor and his surety shall be liable for the amount thereof. Contractor shall not be charged liquidated damages because of any delays in completion of work due to force majeure, as defined at Article 16.5 of the General Conditions. The Contractor shall within 10 days from the beginning of any such delay (unless the District shall grant a further period of time prior to the date of final settlement of the contract) notify the District in writing of the causes of delay; thereupon the District shall ascertain the facts and the extent of the delay and extend the time for completing the work when in its judgment the findings of fact justify such an extension, and its findings of fact thereon shall be final and conclusive on the parties hereto. The additional time granted by the District for completing of the work shall specify the portion of the total thereof, which shall be applied to each segment of the construction schedule yet to be performed according to the terms and conditions of this contract, if any.

12. LIQUIDATED DAMAGES FOR DELAYED SUBMITTALS

The per diem assessment of Liquidated Damages for Contractor's delayed submission of Submittals pursuant to Article 8.1 of the General Conditions is **\$200** per day.

13. ENVIRONMENTAL SAFETY AND HEALTH REQUIREMENTS

Very specific requirements related to environmental, safety and health are outlined in General Conditions Article 12. These requirements include mandatory written programs and daily safety meetings, performance and job hazard analysis, minimum training requirements and minimum personal protection equipment required on the job. All bidders are advised to read Article 12 as compliance is mandatory.

14. NOTICES PURSUANT TO ARTICLE 18.9

Notices pursuant to Article 18.9 of the General Conditions should be addressed to:

Director of Construction
San Diego Unified School District
4860 Ruffner Street
San Diego, CA 92111

15. RISK OF LOSS ON CONTRACTOR

The Contractor shall assume the risk of any and all types of loss and damage to the work or any part thereof, to adjoining property, or to materials or things employed in doing the work, or stored on site, until the District has accepted completion of the project. The District, however, will not assume the risk of any loss or damage to materials and things employed by the Contractor in doing the work. The Contractor with due diligence and dispatch, shall replace or repair, at his own expense the work lost or damaged.

16. CONTRACT DOCUMENTS

Pursuant to Article 2.1.5 in the General Conditions, the District shall furnish the Contractor, free of charge, 5 copies of the Drawings and Contract Documents upon award of the contract.

17. ADJUSTMENT TO CONTRACT PRICE

Pursuant to Article 10.4.3 of the General Conditions, the percentage limits allowed for cost mark-ups on overhead, general conditions costs, and profits associated with the change are listed on "Exhibit A" of the General Conditions which is the form to be used for payment for any extra, additional, or allowances, contingencies or deleted work.

18. CONTRACTOR SITE CHECK-IN

Contractor's superintendent is required to check-in at the main office every day that a work crew is on site and classes are in session. A special sign-in sheet will be provided for this purpose.

19. EMPLOYEE IDENTIFICATION BADGES

All Contractor's and their subcontractor's employees who will be working on-site must wear an identification badge at all times. The badge must have a photo of the employee, their name, and the name of the company they work for on the front face, clearly and legibly displayed.

20. KEYS ISSUED FOR CONSTRUCTION

The Contractor may be issued school site master keys, including gate keys, only upon written authorization from the District. Specific terms of site access shall be requested in writing. The request shall be evaluated as to the need for access and the methods available to provide access without issuing keys. Keys shall be authorized only when no other reasonable means of access is available. The Contractor shall be required to sign the District's Master Key Responsibility Agreement form. This form authorizes the District to deduct funds, up to \$60,000, from available

contract amounts, if keys are lost or misused. The cost of restoring security to the area(s) compromised by the theft, loss or misuse of keys may require re-keying for one or more buildings and costs could be extensive. The holder of the keys to any school site assumes responsibility for the safekeeping of the keys and their use. Keys must not be modified, duplicated, loaned or made available to others. All lost or stolen keys must be reported immediately through the appropriate District representative. All keys must be returned to the District Authorized Lock Shop Representative on or before the end of the defined 30-day punch list period following the achievement of Substantial Completion. Written confirmation from the District Authorized lock Shop Representative is required before Final payment is made by the District. The return of District issued keys are part of the Final Payment Article 7.4.2.(ix) General Conditions of the Contract obligations. The Contractor may be requested to post a bond or deposit as collateral until the keys are returned. Any Contract Time delay or additional Contract Price expense caused by or due to the theft, loss or misuse of District issued keys shall be to the account of the Contractor.

21. MULTIPLE SITE PROJECT MANAGEMENT REQUIREMENTS

Work under this Contract may be conducted simultaneously at different physical locations. The Contractor is required to manage, monitor, generate correspondence, and store documentation for each school location separately, unless indicated differently below. The District will accept no document from the Contractor unless the appropriate contract number and school location is referenced on the document. The Contract Documents are prepared separately to address each site for its unique conditions. All provisions, including Division 1 of the specifications shall be followed for each site accordingly. Requirements include the following:

- A. Submittals. Submittals shall be submitted separately for each site.
- B. Requests for Information. Requests for Information (RFIs) must be school location-specific. RFIs that apply to two or more school locations must be submitted separately for each school location under separate cover. RFIs must be sequentially numbered, with no gaps in numbering, for each school location.
- C. Project Manager and Superintendent. Contractor shall provide at least one (1) Project Manager responsible for all sites and one (1) Superintendent for each site.



**SAN DIEGO UNIFIED SCHOOL DISTRICT
FACILITIES PLANNING AND CONSTRUCTION
2351 CARDINAL LANE, BLDG. M
SAN DIEGO, CA 92123**

NO. CP25-1029-52-00-00

**FURNISH AND INSTALL WALK-IN FREEZERS AT
BELL MIDDLE SCHOOL AND CLAIREMONT HIGH SCHOOL**

VOLUME 1 OF 1

PREPARED FOR:

SAN DIEGO UNIFIED SCHOOL DISTRICT
PHYSICAL PLANT OPERATIONS
4860 RUFFNER STREET
SAN DIEGO, CA 92111

ARCHITECT:

obrARCHITECTURE
2149 EL CAJON BLVD.
SAN DIEGO, CALIFORNIA 92104



San Diego Unified
SCHOOL DISTRICT

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END OF DOCUMENT 00 01 10

SECTION 01 10 00**SUMMARY****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. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Phased construction.
 - 4. Work by District.
 - 5. Work under separate contracts.
 - 6. District-furnished products.
 - 7. Contractor-furnished, District-installed products.
 - 8. Access to site.
 - 9. Coordination with occupants.
 - 10. Work restrictions.
 - 11. Specification and drawing conventions.
 - 12. Miscellaneous provisions.

- B. Related Requirements:

- 1. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of District's facilities.

1.3 PROJECT INFORMATION

- A. Project: Kitchen Modifications Group 6

- B. Project Description: Installation of cold box in (e) storage area with associated mechanical, plumbing and electrical work. Scope of work also includes the demolition of (e) finishes, electrical and plumbing work.

- C. Project Location:

- 1. Clairemont High School. 4150 Ute Dr, San Diego, CA 92117
 - 2. Bell Middle School. 620 Briarwood Rd, San Diego, CA 92139

SUMMARY**01 10 00 - 1****KITCHEN MODIFICATIONS GROUP 6**

- D. District: San Diego Unified School District.
4860 Ruffner Street.
San Diego, CA 92111-1552.
- E. Architect Identification: The Contract Documents, dated 03/25/25, were prepared for Project by: obrARCHITECTURE, 2419 El Cajon Blvd, San Diego, CA 92104.

1.4 CONTRACT

- A. The Project will be constructed under a single prime contract.

1.5 PRECONSTRUCTION DOCUMENT PERIOD

- A. 14 days, starting with the commencement date in the Notice to Proceed, shall be considered the Preconstruction Documentation Period.
 - 1. This time period shall be used for such things a Preconstruction Meeting, submittal deliverables, Schedule of Values, and Baseline Schedule.
 - 2. Nothing else shall be performed at this time without written permission from the District.

1.6 PHASED CONSTRUCTION

- A. The Work shall be conducted in one phase, with each phase substantially complete as indicated:
 - 1. Phase one: Kitchen Modifications at two (2) school sites listed in paragraph 1.3C. Work of this phase shall commence after the Notice to Proceed and be substantially complete and ready for occupancy by 11/14/25.
- B. appropriate action.

1.7 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by District's right to perform work or to retain other contractors on portions of Project.
- B. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- C. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to kitchen and existing coldbox location.

SUMMARY**01 10 00 - 2****KITCHEN MODIFICATIONS GROUP 6**

2. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to District, District's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- E. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.8 COORDINATION WITH OCCUPANTS

- A. Full District Occupancy: District will occupy site and existing building(s) during entire construction period. Cooperate with District during construction operations to minimize conflicts and facilitate District usage. Perform the Work so as not to interfere with District's day-to-day operations. Maintain existing exits unless otherwise indicated.
 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from District and approval of authorities having jurisdiction.
 2. Notify District not less than 72 hours in advance of activities that will affect District's operations.
- B. Partial District Occupancy: District will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with District during construction operations to minimize conflicts and facilitate District usage. Perform the Work so as not to interfere with District's operations. Maintain existing exits unless otherwise indicated.
 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from District and authorities having jurisdiction.
 2. Provide not less than 72 hours' notice to District of activities that will affect District's operations.
- C. District Limited Occupancy of Completed Areas of Construction: District reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not

SUMMARY

01 10 00 - 3

KITCHEN MODIFICATIONS GROUP 6

interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Partial Completion for each specific portion of the Work to be occupied prior to District acceptance of the completed Work.
2. Before limited District occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, District will operate and maintain mechanical and electrical systems serving occupied portions of Work.
3. On occupancy, District will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.9 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to hours indicated in General Conditions. Exceptions to these hours include utility shutdowns and noisy activity.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by District or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify District not less than seven days in advance of proposed utility interruptions.
 2. Obtain District's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate with District operations that may result in high levels of noise and vibration, odors, or other disruption to District occupancy or neighboring properties.
 1. Notify District not less than seven days in advance of proposed disruptive operations.
 2. Obtain District's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products and other controlled substances on District property is not permitted.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

1.11 MISCELLANEOUS PROVISIONS**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION (Not Used)****END OF SECTION 01 10 00**

**SECTION 01 21 00
ALLOWANCES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Related Requirements:
 - 1. Section 01 39 00 "Project Forms" for Allowance Payment Record form.
 - 2. Divisions 02 to 32 sections for specific product and manufacturer requirements and for limitations on substitutions.

1.3 DEFINITIONS

- A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to perform services or defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order (CO).

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products, systems, or services included in allowances, in the form specified.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 ALLOWANCES

- A. Use allowance only as directed by District for District's purposes and only by APRs that indicate amounts to be charged to the allowance.
- B. Allowance includes cost of materials, equipment, delivery, receiving, handling, labor, installation, warranty, and insurance, Contractor's supervision, overhead, profit and bond costs and insurance.
- C. At Project closeout, credit unused amounts remaining in the allowance to District by Change Order.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 SCHEDULE OF ALLOWANCES**

- A. Allowance No. 1: For unforeseen conditions and needs not specified by district but related to the scope of the contract, as directed by district. With the bid document pending DSA and DEH approval, this allowance also covers any necessary changes, up to a lump sum of \$200,000.00.

END OF SECTION 01 21 00

**SECTION 01 25 00
SUBSTITUTION PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for products selected under an allowance.
 - 2. Divisions 02 through 32 Sections for specific product and manufacturer requirements and for limitations on substitutions.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Substitutions include "or equal" products.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form provided at the end of this Section.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by District and separate contractors that will be necessary to accommodate proposed substitution.

- c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and Districts.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS**2.1 SUBSTITUTIONS**

- A. Submit requests for substitution not later than 35 days after the Notice to Proceed.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

REQUEST FOR SUBSTITUTION

Re: _____
 Section # _____ Project Name _____

 Date _____ Item _____

To: _____
 Architect _____

From: _____
 General Contractor _____

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

A.	Comparison	<u>Specified Item</u>	<u>Substitution</u>
1.	Product Name/Model	_____	_____
2.	Manufacturer	_____	_____
	Address	_____	_____
	Phone Number	_____	_____
3.	Product Cost	_____	_____
	Installation/Labor Cost	_____	_____
4.	Delivery Time	_____	_____
	Installation Time	_____	_____
5.	Product Characteristics	_____	_____
		_____	_____
		_____	_____
		_____	_____
6.	Dimensions	_____	_____
	Effects	_____	_____
7.	Guarantee/Warranty	_____	_____
8.	CBC-ES No.	_____	_____
9.	UL Rating	_____	_____

B. Substantiating Data: Attach manufacturer's literature for both specified item and substitution.

C. Samples: Provide samples for both specified item and substitution.

D. Similar Projects

1. _____
Name _____ Date _____

Address _____
2. _____
Name _____ Date _____

Address _____

E. Maintenance Service/Parts:

Name: _____

Address: _____

F. What effect does this substitution have on applicable code requirements?

G. Changes to Drawings and Specifications:

Attach information completely describing changes to be made to drawings and specifications.

- Contractor hereby certifies equal performance and assumes of liability for equal performance.
- Contractor hereby agrees to pay for all costs involved with changing the building design, including engineering, drafting, specifications editing, coordination, and preparation of detailed cost estimates, caused by the proposed substitution.

Submitted by:

Signature

Printed Name

Title

Company

Date

Address

Address

SPECIFICATIONS**NO. CP25-1029-52-00-00**

Telephone _____

Email _____

Signature must be by person having authority to legally bind Contractor to the above terms. Failure to provide legally binding signature will result in retraction of approval.

For Use by District's Representative:

District's Design Consultant Date: _____ <input type="checkbox"/> Accepted <input type="checkbox"/> Not Accepted By (print): _____ Title: _____ Signature: _____	School District Date: _____ <input type="checkbox"/> Accepted <input type="checkbox"/> Not Accepted By (print): _____ Title: _____ Signature: _____
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END OF SECTION 01 25 00

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including the following:
 - 1. Document Control Software.
 - 2. General coordination procedures.
 - 3. Administrative and supervisory personnel.
 - 4. Coordination drawings.
 - 5. RFIs.
 - 6. Project meetings.
- B. Related Requirements:
 - 1. Section 01 32 01 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 01 39 00 "Project Forms" for applicable project forms.
 - 3. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 4. Section 01 74 19 "Construction Waste Management and Disposal" for procedures for managing construction waste materials.
 - 5. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Contractor seeking information required by or clarifications of the Contract Documents.
- B. District Construction Manager: District Construction Manager is General Contractor's sole point of contact for all communications with District. Direct all District communications to District Construction Manager. District Construction Manager shall disseminate communications to appropriate District personnel as necessary.

- C. Document Control Software: The District has implemented a computerized web-accessed document management and control system for the Project referred to herein as Document Control Software. Use this system for all Project Submittals and RFI's.

The District will provide Contractor personnel with access, support, and training in the use of the Document Control Software at no cost to the Contractor.

The Document Control Software includes the following functions:

1. Project directory;
2. Project correspondence;
3. Meeting minutes;
4. Contract modification forms and logs;
5. RFI forms and logs;
6. Task and issue management;
7. Photo documentation;
8. Schedule and calendar management;
9. Submittal forms and logs;
10. Payment application forms;
11. Drawing and specification document hosting, viewing, and updating;
12. Online document collaboration;
13. Reminder and tracking functions;
14. Archiving functions.

1.4 INFORMATIONAL SUBMITTALS

- A. Key Personnel Names: Within ten (10) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
1. Post copies of list in project meeting room, in temporary field office, in prominent location in each built facility, and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for District and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities, including those of the District and separate contractors, to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Pre-installation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as District's property.
 2. Coordinate management and recycling of solid waste generated from construction activities. Refer to Section 01 74 19 "Construction Waste Management and Disposal" for tracking, management and recycling requirements for construction activities related waste.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

- a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - e. Indicate required installation sequences.
 - f. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.

- b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
- 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
- 9. Review: Architect will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
- 10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 33 00 "Submittal Procedures."

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, prepare and submit an RFI using the District's Document Control Software. Immediately notify the District Construction Manager, Project Inspector, District Project Manager, Architect, and Document Controls Specialist of all RFIs submitted.
 - 1. Architect will return RFIs submitted by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. RFI number, numbered sequentially (for revised RFIs, keep the original RFI number, but add an R1, R2, etc. as a suffix.)
 - 3. Date of RFI Question.
 - 4. Name of Contractor, as well as name of individual from Contractor submitting the RFI.
 - 5. Name of Architect.
 - 6. RFI subject.
 - 7. Detailed description of item needing information or interpretation.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.

10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution, if any. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: See Section 01 39 00 "Project Forms" for RFI form. This form will be generated electronically by the Document Control Software from the Contractor's input data.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five (5) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day. Incomplete RFIs or inaccurately prepared RFIs will be returned without action.
1. RFIs will be returned without action if they are used for any purpose other than a request for information. Such uses include:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
- E. RFI Log: The Document Control Software will generate an RFI Log. The Log will be brought to each weekly Project meeting by the District Construction Manager.
- 1.8 PROJECT MEETINGS
- A. General: Attend all project meetings. District Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: District Construction Manager will inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
 2. Minutes: District Construction Manager will record meeting results.

PROJECT MANAGEMENT AND COORDINATION**01 31 00 - 6****KITCHEN MODIFICATIONS GROUP 6**

- B. Preconstruction Conference: District Construction Manager will schedule a preconstruction conference before starting construction, at a time convenient to District, but no later than fourteen (14) days after execution of the Notice to Proceed.
1. District Construction Manager will conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of District, District's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress. Include the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Commissioning requirements and procedures.
 - m. Indoor environmental air quality management during construction.
 - n. Preparation of record documents.
 - o. Use of the premises and existing building.
 - p. Work restrictions.
 - q. Working hours.
 - r. District's occupancy requirements.
 - s. Responsibility for temporary facilities and controls.
 - t. Procedures for moisture and mold control.
 - u. Procedures for disruptions and shutdowns.
 - v. Construction waste management and recycling.
 - w. Parking availability.
 - x. Office, work, and storage areas.
 - y. Equipment deliveries and priorities.
 - z. First aid.
 - aa. Security.
 - bb. Progress cleaning.
 - cc. Request for Substitution procedures.
 - dd. Use of District's Document Control Software for RFIs.
 4. District Construction Manager will record meeting results and distribute them to all parties in attendance within two (2) days of meeting.

- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: District Construction Manager, Project Inspector, Architect, installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise all attendees of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Submittals
 - c. Options.
 - d. Related RFIs.
 - e. Related Change Orders.
 - f. Purchases.
 - g. Deliveries.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 - z. Commissioning requirements and procedures.
 - aa. Indoor environmental air quality management during construction.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

- D. **Project Closeout Conference:** District Construction Manager will schedule and conduct a project closeout conference, at a time convenient to District and Architect, but no later than thirty (30) days prior to the scheduled date of Substantial Completion.
1. Conference will be conducted to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of District, District's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of additional stock and spare parts.
 - f. Requirements for demonstration and training.
 - g. Commissioning requirements and procedures.
 - h. Indoor environmental air quality requirements prior to occupancy.
 - i. Preparation of Contractor's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - k. Submittal procedures.
 - l. The District's partial occupancy requirements.
 - m. Installation of the District's furniture, fixtures, and equipment.
 - n. Responsibility for removing temporary facilities and controls.
 4. Minutes: District Construction Manager will record meeting results and distribute to all parties in attendance within two (2) days of meeting.
- E. **Progress Meetings:** District Construction Manager will conduct Project Progress Meetings at weekly intervals. Project Progress Meetings are in addition to specific meetings held for other purposes, such as Schedule Review Meetings.
1. Attendees: In addition to representatives of District and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: District Construction Manager will review minutes of previous progress meeting. District Construction Manager will review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

- a. Schedule Updating: Revise Look-Ahead Schedule prior to each Progress Meeting. Send (by Email) the revised Look-Ahead Schedule to the District Construction Manager no later than 24 hours before the next Progress Meeting. The Look-Ahead Schedule shall be submitted in PDF electronic file format using computer software acceptable to District Construction Manager.
 - b. Review present and future needs of each entity present including:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of proposal requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Documentation of information for payment requests.
 - 3. Minutes: District Construction Manager will record meeting results and distribute to all parties in attendance within two (2) days of the meeting.
- F. Monthly Schedule Review Meetings: See Section 01 32 01 "Construction Progress Documentation."

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION (Not Used)****END OF SECTION 01 31 00**

**SECTION 01 31 10
CONTRACTOR PERSONNEL**

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 Contractor personnel to be assigned to this Project.
- B. Related Requirements:
 - 1. Section 01 31 00 "Project Management and Coordination" for project management procedures.
 - 2. Section 01 32 01 "Construction Progress Documentation" for scheduler requirements.

1.3 KEY CONTRACTOR PERSONNEL

- A. Contractor shall assign the following minimum personnel to the project:
 - 1. Contractor Construction Manager: Full time on-site.
 - 2. Contractor Construction Superintendent: Full Time on-site.
 - 3. Contractor Assistant Construction Project Manager: Full time on-site.
- B. Contractor shall assign the following minimum personnel to the project:
 - 1. Contractor Construction Manager: Full time on-site.
 - 2. Contractor Construction Superintendent: Full Time on-site.
 - 3. Contractor Assistant Construction Project Manager: Full time on-site through 50% completion.
- C. Contractor shall assign the following minimum personnel to the project:
 - 1. Contractor Construction Manager: Part time on-site.
 - 2. Contractor Construction Superintendent: Full Time on-site.
 - 3. Contractor Assistant Construction Project Manager: Part time on-site.
- D. Contractor shall assign the following minimum personnel to the project:

1. Contractor Construction Manager: Part time on-site.
2. Contractor Construction Superintendent: Part Time on-site.

1.4 REQUIREMENTS FOR KEY PERSONNEL

- A. Contractor Construction Manager shall have a minimum of ten years experience as Construction Manager or Superintendent on projects of similar size and scope.
- B. Contractor Construction Superintendent shall have a minimum of ten years experience as Construction Superintendent on projects of similar size and scope.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 10

SECTION 01 32 01
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Daily construction reports.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for phased construction and Preconstruction Document Period.
 - 2. Section 01 31 00 "Project Management and Coordination" for use of District's Document Control Software.
 - 3. Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.
 - 4. Section 01 40 02 "Quality Requirements, Contractor Laboratory" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity whose delay would result in the delay to overall duration.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
 - 4. Milestone Activity: An activity that does not occupy time or resources, but highlights an event.
- B. Activity Codes: Values assigned to schedule activities to organize the schedule into groups for reporting and analysis. Examples include Responsibility, Building, and Site Area.

- C. Calendar: Defines the week for different activities within the CPM schedule. Examples of calendars include 5-day week minus holidays, 7-day week, and 6-day week. Different calendar types may be used in the CPM schedule.
- D. Constraint: In the CPM schedule, a constraint is used to affect the float, duration, or date of an activity.
- E. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships.
 - 1. CPM Network: A sequence of inner-connected activities. Network calculations determine the critical path and when activities can be performed.
- F. Critical Path: The network of schedule activities that establishes the minimum overall Project duration.
- G. Data Date: The date used as the starting point for schedule calculations. For baseline CPM schedules, the Data Date is the first date of the schedule where an activity occurs. For monthly updates, the Data Date is the first workday after the monthly cutoffs as decided by the District Construction Manager.
- H. Day: A calendar day, unless otherwise specifically defined. Where “Day” is inherently differently defined, such as in schedules prepared using Microsoft Project, convert days to account for specified calendar days.
- I. Delay: An interruption of work. See the General Conditions.
- J. Milestone: The starting or ending point of an activity or linked series of activities. A milestone in the schedule contains zero duration.
 - 1. Key Milestone: A major milestone. A key milestone includes the following: Notice to Proceed, Substantial Completion, Phase Start Date, and Phase Finish Date. Add additional Key Milestones as directed by District Construction Manager.
 - 2. Contractual Milestone: A milestone tied to Liquidated Damages. Substantial Completion is both a Key and Contractual Milestone.
- K. Float: The measure of leeway in starting and completing an activity.
 - 1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 2. Total float is the amount of time by which a part of the Work may be delayed from its early dates before it delays a succeeding activity.
 - 3. Contract Float: The amount of time between the Contractor’s anticipated dates for early completion of the Work, or specified part, and the corresponding Contract Time.
 - 4. Ownership of Float: Total float and contract float belong to the project and are not for the exclusive benefit of any party. Total float and contract float are jointly owned, and are expiring resources available to the District or the Contractor on a

first-come-first-served-basis to accommodate changes in the Work, or to mitigate the effects of float for the benefit of the project. Monitor float to determine if any float erosion is for the benefit of the project.

5. Float Manipulation: Utilizing unrealistic or inflated durations, imposed dates, artificial logic and/or lags, preferential logic, date constraints, and others that results in an impact to Float. Do not manipulate float. Add detail within the schedule in order to mitigate the use of Float manipulation. Provide a detailed written explanation in the Baseline Narrative for items seen as potential float manipulation if directed by District Construction Manager. After a review of the Baseline Schedule and the detailed written explanation, any such actions ultimately seen as Float manipulation by the District Construction Manager may result in direction for a Baseline revision and re-submittal.

- L. Lag: A relationship delay between CPM schedule activities.
- M. Near-Critical Activity: A non-critical activity with a Total Float value within 10 workdays of the Critical Path.
- N. Percent Complete: The portion of an activity that is complete based on the measurement of work accomplished. Percent completes are ultimately decided by the District Construction Manager.
- O. Relationships: Ties between activities within the CPM schedule.
- P. Target Schedule: A different version of the CPM schedule that can be used as a basis for comparison against another CPM schedule.
- Q. TIA: Time Impact Analysis.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 1. PDF electronic file(s).
 2. Electronic software file (for all CPM schedule submittals). Provide a unique file name in the schedule software for all CPM Schedules.
 3. Two paper copies of all required reports and charts unless directed otherwise by the District Construction Manager.
 4. All hardcopies shall be signed and stamped by the Contractor's Project Manager.
 5. Transmittal.
- B. Contractor's Construction Schedule:
 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (baseline, monthly update, time impact analysis, etc.) and submittal date on label.

- C. Reports: As part of every CPM schedule submittal, submit each of the following reports:
1. Detailed Gantt-chart: Individual columns on left shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, calendar identifier, total float, predecessors and successors. Activities shall be grouped in a manner acceptable to the District Construction Manager. All activities shall be depicted, and activities shall be sorted by early start dates, then total float and early finish dates. Gantt-chart shall be on a page of sufficient width required to display entire schedule for Contract Time. Size of paper/sheet is at discretion of District Construction Manager, and sheet size shall be either 8.5" x 11" or 11" x 17". Gantt-chart shall depict relationship lines between activities and shall also clearly show the critical path.
 - a. Columns on monthly updates shall also include: current month's percent complete.
 2. Schedule Narrative Report: With every CPM schedule submittal, submit a schedule narrative. The narrative report shall contain the following:
 - a. Baseline Schedule: Sufficiently detailed explanations of assumptions in baseline schedule development including:
 - 1) General work sequencing, including phasing and interim housing considerations.
 - 2) Justification of the critical path.
 - 3) Long lead equipment or material items.
 - 4) Constraints and challenges to completing the work.
 - 5) Coordination assumptions, both with subcontractors (e.g. coordination drawings, Building Information Modeling, etc.) and other parties (e.g., District, Architect/Engineer, School Site Staff, Utility entities, etc.)
 - 6) Work week schedule, work hours and non-working days, including holidays, work time constraints such as limitations to academic calendar breaks, after-school hours, etc.
 - 7) Person(s) preparing and providing input towards schedule submittal.
 - b. Monthly Update: Items in this narrative report shall include:
 - 1) Physical progress accomplished during the report period, broken down by each building and site area (e.g. parking lot, play field, second floor, etc.).
 - 2) Explanation of Critical Path if changed from previous month's update (or accepted Baseline, if first Monthly Schedule Update).
 - 3) Explanation of potential delays and/or problems and their estimated impact, Key and/or Contractual Milestones.
 - 4) All Notices of Delay that have been submitted to the District Construction Manager.

- 5) Alternatives for possible schedule recovery to mitigate delay or potential delay.
 - 6) Known or anticipated problems with delivery of materials or equipment.
 - 7) Approved weather/weather impact dates incurred in previous month, along with affected CPM schedule activity identification numbers and activity descriptions.
 - c. Other variations of the above reports, as directed by the District Construction Manager.
- D. Daily Construction Reports: Submit to District Construction Manager at weekly intervals.

1.5 QUALITY ASSURANCE

- A. Scheduler Qualifications: An experienced specialist in CPM scheduling who is capable of satisfying the requirements described herein. The Scheduler is to provide planning, evaluation, reporting and delay analysis using CPM scheduling.
- B. Schedule Software: All CPM schedules shall be prepared with a Windows operating system based CPM scheduling computer software program capable of satisfying all the requirements herein, and is subject to the review and acceptance by the District Construction Manager.

1.6 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, BASELINE

- A. Baseline Schedule: Prepare and submit a baseline CPM schedule that shows the breakdown of all work into activities to the extent required to effectively plan the project, report work progress, analyze time impacts and show all logical relationships (ties) between activities. The District Construction Manager shall accept, accept as noted, or direct the Contractor to revise and re-submit, the Baseline Schedule submittal. The District Construction Manager's Baseline Schedule review will be based

on the District Construction Manager's evaluation of the Baseline Schedule's reasonableness and compliance with the Contract Documents. The Contract CPM Schedule shall be the basis for monitoring the Contractor's progress against milestone dates and Contract Time, and the evaluation and reconciliation of extensions in Contract Time. The Baseline Schedule shall communicate and constitute the Contractor's detailed intent for planning and executing the work. Construct the Baseline Schedule based on the Contract Documents, including any addenda received during the bid phase. The District will assume the Contractor has coordinated with all subcontractors when developing the Baseline Schedule.

1. Breakout of Work Into Multiple Schedules: Even if multiple school sites or DSA numbers are attributed to a Contract, multiple schedules that break out work by school site, DSA number, etc., are not allowed.
2. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion as defined in the General Conditions.
 - a. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
 - b. Early Completion: If the District Construction Manager accepts an early completion schedule and the District Construction Manager does not revise the Contract completion date as defined in the General Conditions, the Baseline must first include a float activity that fills the time between the early completion and the contractual substantial completion date. The Contractor agrees to forego any extended overhead between early completion noted in the Baseline and the contractual substantial completion date.
3. Activities in the Baseline Schedule shall comply with the following:
 - a. Activity Duration: Estimate the amount of time to start and complete each activity. Define field work activities so no activity is longer than 15 workdays, unless specifically allowed by District Construction Manager.
 - b. Units of Time: Workdays shall be the default unit of time for an activity in the schedule. Indicate nonworking days and holidays incorporated into the schedule in order to correlate with Contract Time.
 - c. Critical Path: Critical Path is to be easily identifiable. Any part of the Baseline Schedule's Critical Path deemed unreasonable by the District Construction Manager may result in direction for a Baseline Schedule revision and re-submittal.
 - d. Percentage of Critical and Near-Critical Activities: Plan the Work and provide for and allocate resources in the execution of the Work so that the proportion of incomplete schedule activities with total float of 20 workdays or less within the Critical path shall not exceed 33 percent of all incomplete schedule activities, unless acceptance for a greater proportion is granted by the District Construction Manager.
 - e. Procurement Cycle Activities: Include procurement process activities as separate activities in the schedule. Procurement cycle activities include

- submittals, submittal reviews and approvals, purchasing, fabrication, and delivery.
- f. Submittal Review Time: Include review times indicated in Section 01 33 00 "Submittal Procedures" in Baseline Schedule.
 - g. Relationships and CPM Network: CPM networks shall be closed, whereby every activity shall have, at a minimum, one predecessor and one successor relationship. The exceptions to this closed network rule are the network's start and finish milestones.
 - h. Constraints: Constraints shall be scrutinized and shall only be used to reflect contractually and/or environmentally imposed conditions. Add schedule activities and detail to mitigate the use of Constraints. Constraints are not permitted where an activity or logical relationship is appropriate, unless specifically accepted by the District Construction Manager.
 - i. Lags: Lags shall be scrutinized. Add schedule activities and detail to mitigate the use of Lags. Lags of less than -1 are not permitted, unless specifically accepted by the District Construction Manager.
 - j. Schedule Settings: The setting in the CPM scheduling software shall be set so that the logic is retained when calculating the schedule. Critical activities shall be defined as Longest Path. The "progress override" option shall not be utilized, unless directed otherwise by the District Construction Manager. Autocost, Resource, and Schedule calculation rules shall be set to the default settings.
 - k. Activity Detail: Field work activities shall not reflect a combining of work located in separate buildings or site areas, work corresponding to different Specifications Sections, work performed by different Subcontractors, or rough and finish work of the same trade. The CPM Schedule shall include activities and appropriate time for temporary items (e.g. scaffolding and concrete formwork), curing, testing, items that interface with work performed by others (e.g. Owner Furnished Owner Installed items), regulatory agency approvals, permitting, City of San Diego and utility activities, physical checkout, startup, mobilization, operational and maintenance manual preparation, equipment and systems training, cleanup, and contractor's internal punch list.
 - l. Activity Descriptions: Descriptions for schedule activities shall provide adequate detail that defines the activity, scope and location.
 - m. Activity Coding: Activities shall be mapped so they are grouped in a manner acceptable to the District Construction Manager.
 - n. Milestones: Include Key Milestones indicated in the Contract Documents in Schedule.
 - o. Negative Float: The Baseline Schedule shall not contain negative float.
 - p. Weather: The Baseline Schedule shall include, during the period from the start of mobilization (or start of field work activity, whichever starts first) through the date of Substantial Completion, workdays for anticipated weather delays affecting the critical path.
- 1) The weather allowance shall be depicted as one separate activity in the CPM Schedule as the final activity prior to the Substantial Completion milestone, and shall be on the critical path with no concurrent activities.

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- a) Include weather days as an allowance in the CPM schedule per the following table:

Weather Table												
	Month											
Anticipated Weather Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	7	5	7	2	1	1	0	0	1	2	3	5

- b) If the Contract Time starts or ends in the middle of a month, the weather allowance shall be prorated. For example, if mobilization starts on February 1 and Substantial Completion is November 20 of the same year, the weather allowance is 20 workdays.
- 2) Unused weather allowance days become jointly owned float.
 - 3) If the number of approved weather days in a month exceed the number depicted in the Weather Table, or if the grand total of approved weather days exceed the number allotted in the contract, the number of weather days in excess are excusable and non-compensable.
 - 4) Weather or the results of weather on non-scheduled workdays will not be considered. Reference documents shall include CPM schedules and Look Ahead schedules to determine scheduled workdays.
 - 5) If the Contractor considers weather or the results of weather as an impact to the critical path and/or a Contractual Milestone, the Contractor has two workdays from the date in question to provide written justification for the weather day request, describing the Primavera activity/activities impacted, as well as describing how over 50 percent of the Critical Path work for the requested day was impacted. Describe work done to mitigate weather impact.
 - 6) The District Construction Manager determines if a weather day has been incurred, and the Critical Path and/or Contractual Milestone so affected. If the Contractor does not provide written justification regarding weather impacts, the District Construction Manager can still determine if weather days have been incurred.
 - 7) If weather impacts a Contractual Milestone for a phase that is not on the critical path, the Contractor shall receive excusable and non-compensable relief equal to the number of days impacted by weather.
- B. Work Restrictions: Include any work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

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1. Work by District: Include a separate activity for each portion of the Work performed by District, including Owner Furnished Contractor Installed (OFCI) and Owner Furnished Owner Installed (OFOI) items.
 2. District-Furnished Products: Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.
 3. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with any existing construction.
 - b. Limitations of continued occupancies.
 - c. Partial occupancy before Substantial Completion.
 - d. Use of premises and any site-specific restrictions.
- C. Baseline Schedule: Submittal, Review and Acceptance. Within the timeline specified below (Schedule Table 1), the Contractor shall submit the Baseline Schedule to the District Construction Manager for review and acceptance.

Schedule Table 1

Description	Calendar Days for Individual Item	Cumulative Calendar Days
Contract Time Start Date, per Notice to Proceed	0	0
Contractor submits complete Baseline Schedule submittal to District Construction Manager for review	21	21
District Construction Manager presents review comments (and possible acceptance) to Contractor (Meeting may be required, at District Construction Manager's discretion)	7	28

1. The deduction for Contractor's delayed submission of the complete Baseline Schedule submittal is \$150 per day. This deduction also applies to resubmittals.
2. Upon submittal by the Contractor, the District Construction Manager will review the Baseline Schedule and provide comments within the timeframe shown in Schedule Table 1. The District Construction Manager has the ability to question any aspect of the Baseline Schedule submittal. If the District Construction Manager raises questions or identifies schedule deficiencies or noncompliance with the Contract Documents, a revision and re-submittal is required. The Contractor shall make appropriate adjustments or corrections and shall deliver to the District Construction Manager the Baseline Schedule re-submittal within 7 days of receipt of the District Construction Manager's comments. Indicate in writing the adjustments or corrections made by the Contractor, including

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individual responses to every comment made by the District Construction Manager on the previous submittal. The District Construction Manager will review and return written comments on the re-submitted Baseline Schedule within 7 days of receipt of the Contractor's re-submittal. The above process shall be repeated until the District Construction Manager provides written notification to the Contractor that the Baseline Schedule has been accepted.

- a. The District may withhold 10 percent of each progress payment until such time that the Contractor submits and the District Construction Manager accepts the Baseline Schedule submittal. The District Construction Manager may also stop the Work in accordance with the General Conditions if the Baseline Schedule has not been accepted. Delays here shall be deemed inexcusable.
3. Upon acceptance of the Baseline Schedule, all activities and their relationships shown on the Baseline Schedule may not be changed, added, or deleted without the consent of the District Construction Manager. The Contractor may not alter activity identification numbers, or rename activities without the District Construction Manager's written consent.
4. The initial accepted Baseline Schedule is a schedule that shall reflect no progress on schedule activities.
5. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of District Construction Manager's acceptance of the schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice to Proceed. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, MONTHLY SCHEDULE UPDATES

- A. Contractor's Construction Schedule Updating: At monthly intervals update the schedule to reflect actual progress and forecast the remainder of the work. Submit the Monthly Schedule Update to the District Construction Manager who will either accept it,

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accept it with notes, or direct the Contractor to revise and resubmit. On the last workday of each month or other day determined by District Construction Manager, submit a draft schedule update for review. The Data Date shall be the 1st day of the month. For example, if the monthly update is to capture all work accomplished in April the Data Date shall be May 1st. the Draft Monthly Schedule Update shall consist of the following:

1. A hardcopy print out of the Detailed Gantt-chart distributed to the District Construction Manager. Sheets for this item are to be no larger than 11" x 17".
 2. A markup of the hardcopy print out showing percent completes, actual start dates and actual finish dates to indicate work accomplished during the month. Also indicate the expected finish dates or remaining duration for activities that have started but have not yet completed; remaining duration shall be the Contractor's best estimate of the time required to complete activities.
- B. Monthly Schedule Review Meeting: Within three (3) days of the Draft Monthly Schedule Update submittal, the Contractor shall meet with District Construction Manager to finalize the Monthly Schedule Update, as well as discuss required corrections and proposed revisions to the schedule.
1. After the meeting, make any needed adjustments to the Schedule and Schedule of Values as directed by the District Construction Manager, make final entries in the schedule software, recalculate the schedule, and submit the final Monthly Schedule Update submittal. The Monthly Schedule Update submittal, including Progress Payment submittal items, is due no later than three (3) days following the Monthly Schedule Review Meeting.
- C. Monthly Schedule Update:
1. Requirements: The Monthly Schedule Update shall not be used to delete activities, add activities, make title changes, make activity coding changes, or to make logic changes.
 2. Distribution: Distribute copies of schedule update to District Construction Manager. Also submit compact disc containing files of reports/charts described in Section 1.4.C, as well as electronic backup file of schedule. The Contractor must submit the Monthly Schedule Update package to the District Construction Manager before the District will process an Application for Progress Payment for each month.
 3. Other activities in Schedule: The only activities to be added to the Monthly Schedule Updates are the following:
 - a. Approved Time Impact Analysis.
 - b. Approved Weather Dates (one Activity per approved Weather Date).
 - 1) The original duration for the weather allowance activity shall be reduced each month by the number of approved weather days, only up to the number of weather days per month per the Weather Table. For example, if there are 5 approved weather days in May, the original duration shall still only be reduced by 1.

- c. Procurement Cycle re-submittals (i.e., Specification re-submittal after rejection, Specification re-submittal review.
- 4. Review: The District Construction Manager, upon review, will either accept, accept with comments, or reject the Monthly Schedule Update submittal. Allow seven (7) days for the District Construction Manager's review of the Monthly Schedule Update package.
 - a. Completeness of Submittal: The District may withhold up to 5 percent of the pre-retention progress payment if, in the District Construction Manager's opinion, the Contractor has failed to meet the Monthly Schedule Update submittal requirements.
 - b. Acceptance of the Monthly Schedule Update submittal by the District Construction Manager shall be a condition precedent to the processing of the subsequent Progress Payment.

3.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, SCHEDULE CORRECTION

- A. Each month, the Contractor shall address corrections to the schedule that were identified by the District Construction Manager during the review of the last Monthly Schedule Update. These corrections generally include correction of inaccurate or missing actual dates, correction of logic for activities being driven by the data date, incorrect percent complete, and out of sequence progress. The District Construction Manager may require the Contractor to adjust, add to, or clarify any portion of the schedule that he/she may consider insufficient to monitor the work. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. If the Monthly Schedule Update submittal is rejected, the Contractor must individually respond to every correction and review comment received from the District Construction Manager in the re-submittal of the Monthly Schedule Update package.
- C. If the submittal is conditionally accepted with noted exceptions, the Contractor shall respond to every correction and review comment via the schedule narrative of the next Monthly Schedule Update submittal. Failure of the Contractor to specifically respond to each of the District Construction Manager's previous review comments may result in rejection of the following submittal.

3.3 CONTRACTOR'S CONSTRUCTION SCHEDULE, LOOK AHEAD SCHEDULES

- A. Look Ahead Schedule: Prepare and submit a report indicating activities performed in the one week prior and two weeks following the day of week as determined by the District Construction Manager. Due to the District Construction Manager in electronic format no later than 24 hours before the start of each weekly progress meeting, the Look Ahead Schedule shall include the following:
 - 1. Columns on left hand side of report, indicating the following:

- a. Activity number, corresponding to the same field in the CPM schedule.
 - 1) Potential or approved change orders shall be included as activities with temporary activity identification numbers until such time that change orders are approved and incorporated into the CPM schedule.
 - b. Activity description.
 - c. Responsibility.
 - d. Average estimated crew size during this time.
2. Dates on the right hand section of report, with marks noting the specific dates that activity was performed / will be performed for each of the look ahead activities.
 3. Generated in a CPM schedule software application or Microsoft Excel.
 4. Details shall include material and equipment deliveries, non-work days such as holidays, and approved weather days.
 5. Other information or formatting, at the discretion of the District Construction Manager.

3.4 CONTRACTOR'S DAILY REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events relating to this Contract:
 1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Count of personnel and hours worked at Project site by trade.
 4. Visitor(s) to the Project site.
 5. Major Equipment at Project site.
 6. Material deliveries.
 7. Work activities performed at Project site, including CPM schedule activity identification numbers.
 8. High and low temperatures and general weather conditions, including any precipitation totals.
 9. Site Conditions.
 10. Request for weather day, include CPM schedule activity identification number(s) and activity description(s) affected.
 11. Action(s) taken to prepare for anticipated upcoming weather event.
 12. Accidents and near-accidents.
 13. Meetings and significant decisions.
 14. Issues incurred or addressed.
 15. Unusual events.
 16. Stoppages, delays, shortages, and losses.
 17. Meter readings and similar recordings.
 18. Emergency procedures.
 19. Orders and requests of authorities having jurisdiction.
 20. Change Orders received and implemented.

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21. Change Directives, Field Work Orders, or Architect's Supplemental Instructions received and implemented.
 22. Services connected and disconnected.
 23. Equipment or system tests and startups.
 24. Partial completions and occupancies.
 25. Substantial Completions authorized.
- B. Daily Reports are to be prepared in such a way that all text is Optical Character Recognition (OCR) searchable. Hand-written text is not acceptable.
- C. Upon receipt, the District Construction Manager will review each Daily Report. If needed, corrections to Daily Reports may be required.
- D. Starting with the first day of construction activity or any activity on site, submit a separate and distinct Daily Report for each day. Daily Reports for the previous week are due no later than Monday of the following week. For example, the Daily Reports for Monday April 1st through Friday April 5th are due to the District Construction Manager no later than Monday April 8th.

3.5 CONTRACTOR'S CONSTRUCTION SCHEDULE, RECOVERY SCHEDULE

- A. In the event that the progress of the Work or the sequencing of the activities of the Work differs from that indicated in the Baseline Schedule or previous Monthly Update Schedules, the District Construction Manager may direct the Contractor to submit a Recovery Schedule. Prepare and submit a Recovery Schedule if the current monthly schedule update depicts a late Substantial Completion forecast, or as otherwise deemed appropriate by the District Construction Manager.
1. Within ten (10) days of the District Construction Manager's direction, prepare and submit a Recovery Schedule to the District Construction Manager demonstrating the Contractor's plan to recover lost time. The District Construction Manager will review the Recovery Schedule and provide documented comments within seven (7) days. Appropriate recovery actions include assignments of additional labor or equipment, shift or overtime work, expediting of submittals or deliveries, overlapping of activities, or sequencing changes to increase activity concurrence. The accompanying narrative shall describe the cause of the problems and the actions planned by the Contractor to recover the schedule.
- B. If the delay necessitating the Recovery Schedule is caused by the Contractor, all costs for recovery shall be borne by the Contractor.

3.6 CONTRACTOR'S CONSTRUCTION SCHEDULE, SCHEDULE REVISION

- A. Schedule Revisions are defined as any changes to schedule activities or logic other than the updating of actual start and completion dates, percent complete or remaining duration.

- B. Revise the Baseline Schedule when the District Construction Manager determines that it is no longer useful as a status and control mechanism, when a change or delay impacts the Contractor's timing and sequence of the work, or when the Contractor has submitted logic changes that affect critical or near-critical activities as determined by the District Construction Manager.
 - 1. If directed by the District Construction Manager, prepare and submit within ten (10) days the Schedule Revision submittal for review and acceptance. Provide a separate narrative, the electronic data file from the CPM schedule software, and a Detailed Gantt Chart for each proposed revision showing the revised activities and how the Contractor proposes to tie them into the accepted CPM Schedule. The District Construction Manager will provide comments to the Contractor within seven (7) days of receipt. After the District Construction Manager accepts the specific activities and logic changes proposed in the schedule revision, promptly incorporate the revision into the next Monthly Schedule Update.

3.7 CONTRACTOR'S CONSTRUCTION SCHEDULE, TIME IMPACT ANALYSIS

- A. Time Impact Analyses shall demonstrate the impacts of the delay to the critical path, and shall be completed in one of two ways:
 - 1. Prospective Time Impact Analysis (Forward Looking):
 - a. Submit a Prospective Time Impact Analysis (TIA) within fourteen (14) days of receiving a written request for a TIA from the District Construction Manager for an issue that has yet to complete.
 - 2. Retrospective Time Impact Analysis (Backward Looking):
 - a. If the Contractor experienced what he/she considers to be an excusable delay to the critical path, submit a Retrospective Time Impact Analysis within fourteen (14) days of the completion of the delay event.
 - b. All efforts shall be made to rectify such TIAs as contemporaneously as possible.
 - 3. Notes:
 - a. The Time Impact Analysis submittal shall consist of a CPM schedule sub-network (fragnet) derived by adding activities and relationships representing the delay into the last accepted Monthly Schedule Update prior to the start of the delay event (or the accepted Baseline, if event occurs before first Monthly Schedule Update).
 - b. If the Contractor does not submit a Time Impact Analysis request within the timeframes noted above, the Contractor shall be deemed to have voluntarily irrevocably waived any rights to additional time and cost.
 - c. If the District Construction Manager determines that the accepted schedule used as the basis for the Time Impact Analysis does not appropriately represent the conditions prior to the event, meet with the District Construction

Manager to jointly update the schedule to the day before the start of the event being analyzed.

- B. Multiple issues are not to be combined into a single Time Impact Analysis submittal.
- C. Include the following items with all Time Impact Analysis Request submittals:
 - 1. A fragnet where impacts to the critical path can be clearly viewed, with distinct activities for each component of the Time Impact Analysis, breaking out activities by Responsible party (Contractor, Architect/Engineer, District, etc.), trade (Mechanical contractor, Concrete contractor, etc.), and site area (e.g., parking lot, second floor staff restroom, library, etc.).
 - 2. A written narrative that notes the following:
 - a. The number of days requested.
 - b. A detailed description on the cause and effect of delay.
 - c. A detailed description of the Contractor's daily activities relating to the delay on each day during the delay period, as well as a description of the Contractor's diligence in mitigating the delay.
 - d. A list of additions, deletions and/or changes to activities and logic.
 - e. For Retrospective Time Impact Analyses, the Contractor needs to address gains and losses to activities impacting the critical path during the period(s) in question.
 - 3. All supporting backup documentation (e.g., Requests for Information, Field Work Orders, Correspondence, etc.).
 - 4. An electronic copy of the CPM schedule application file(s) used for the TIA.
- D. Allow ten (10) days after receipt of the Time Impact Analysis submittal for the District Construction Manager to accept or reject the request.
- E. The Contractor shall not incorporate any part of the Time Impact Analysis into the Monthly Schedule Update until the associated Change Order has been approved.
- F. If a Time Impact Analysis submitted by the Contractor is rejected by the District Construction Manager, request a Meet and Confer with the District Construction Management Director within fourteen (14) days of rejection to discuss and resolve issues related to the request. If agreement is not reached, the Contractor will be allowed ten (10) days from the meeting with the District Construction Management Director to give notice in strict conformity with the applicable provisions of the General Conditions.
- G. Where the District Construction Manager has not rendered formal decision on the Contractor's Time Impact Analysis for adjustment of Contract Time, and the parties are unable to agree as to amount of adjustment to be reflected in the CPM Schedule, reflect that amount of time adjustment in the CPM Schedule as the District Construction Manager may accept as appropriate for the interim. It is understood and agreed that such interim acceptance by the District Construction Manager will not be binding and will be

made only for purpose of continuing to schedule work, until such time as a formal decision as to an adjustment, if any, of the Contract Time acceptable to the District Construction Manager has been rendered.

- H. The Contractor shall be responsible for all costs associated with the preparation of the Time Impact Analysis for inexcusable or concurrent delays. For critical path delays approved as excusable by the District, the Contractor will be paid a flat fee of \$300.00 per Time Impact Analysis submittal, to be invoiced as a separate Change Order after incorporation into the accepted CPM schedule. A Time Impact Analysis request without merit will not be approved, and hence, not reimbursed.

3.8 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: In addition to what is specified herein, comply with procedures contained in The Associated General Contractors of America's "Construction Planning & Scheduling Manual".
- B. Timely submissions of the schedules described in this Section are of significant importance, and lack of or late receipt diminishes their value to the Project.

END OF SECTION 01 32 01

SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting photographic documentation.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Include same information as corresponding photographic documentation.
- B. Color Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Digital Camera: Minimum sensor resolution of 8 megapixels.
 - 2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
 - 3. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name of Contractor.
 - c. Date photograph was taken.
 - d. Description of location, vantage point, and direction (by compass point), and elevation or story of construction.
 - e. Unique sequential identifier keyed to accompanying key plan.

- C. Video Recording: At the Contractor's option, provide video recording in lieu of photographs specified in paragraph, "Preconstruction Photographs." Submit one copy in digital video disc format acceptable to District.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name of Contractor.
 - c. Date videotape was recorded.

1.4 USAGE RIGHTS

- A. If a professional photographer is engaged to take photographs or video recordings, obtain and transfer copyright usage rights from photographer to District for unlimited reproduction of photographic documentation.

1.5 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in both RAW and JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.
- B. Digital Video Recordings: Provide high-resolution, digital video disc in format acceptable to District.

1.6 PHOTOGRAPHS

- A. General: Take color photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in file name for each image.
- C. Preconstruction Photographs: Before commencement of excavation, take photographs that show preconstruction conditions of existing landscape materials; on-site paving; building interior finishes to include ceilings, walls and floors; and interior and exterior equipment that are to remain in place.

1. The photographs will be used to determine responsibility for damage that might appear to have been caused by construction activities. It will be the Contractor's responsibility, through photographs, to show that damage was preexisting.

1.7 VIDEO RECORDINGS

- A. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.
 1. Confirm date and time at beginning and end of recording.
 2. Begin each video recording with name of Project, Contractor's name, and Project location.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION (Not Used)****END OF SECTION 01 32 33**

**SECTION 01 33 00
SUBMITTAL PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 01 31 00 "Project Management and Coordination" for use of District's Document Control Software.
 - 2. Section 01 32 01 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Section 01 40 02 "Quality Requirements / Contractor Laboratory" for submitting quality control schedules and reports.
 - 4. Section 01 77 00 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
 - 5. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 6. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 7. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of District's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

- C. Document Control Software: The District has implemented a computerized web-accessed document management and control system for the Project referred to herein as "Document Control Software." Use this system for all Project Submittals unless noted otherwise.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect or District and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with Contractor's construction schedule.
 - 2. Initial Submittal: Submit concurrently with Baseline Schedule.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 - 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL FORMATS

- A. Architect's Digital Data Files:
 - 1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.

- a. Digital data drawings files will only be made available with Contractor's signed acceptance of Architect's electronic files/documents use disclaimer.
 - b. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - c. Digital Drawing Software Program: The Contract Drawings are available in PDF.
 - d. Execute a data licensing agreement in form acceptable to District and Architect.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal timing of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. DSA review: Where submittal must be reviewed by DSA, allow 35 days for review of submittal.
- D. Options: Identify options requiring selection by Architect. Make all submittals electronically using District's Document Control Software.
- E. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations.

- F. Electronic Submittals: Provide submittals using District's Document Control Software. Immediately notify Architect, District Construction Manager, Project Inspector, and Document Control Specialist of all submittals made.
- G. Resubmittals: Make resubmittals in same manner as initial submittal.
 - 1. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Furnish one copy of each final action submittal marked with approval notation from Architect's action stamp to Project Inspector.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Post electronic submittals as PDF electronic files directly to Document Control Software.
 - a. Architect will post annotated file and notify Contractor of posting.
 - 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Provide certificates and certifications signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.

- c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Prepare Shop Drawings on same digital data software program, version, and operating system as original Drawings
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

- a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
3. Provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as District's property, are the property of Contractor.
5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

SUBMITTAL PROCEDURES

01 33 00 - 6

KITCHEN MODIFICATIONS GROUP 6

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. PDF electronic file.
- F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- G. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- H. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- I. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- J. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- K. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- L. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- M. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

- N. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
 2. Date of evaluation.
 3. Time period when report is in effect.
 4. Product and manufacturers' names.
 5. Description of product.
 6. Test procedures and results.
 7. Limitations of use.
- O. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- P. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- Q. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- R. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of applicable codes and regulations, and calculations, list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

1.7 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
1. Architect will not review submittals that do not have Contractor's review and approval.

1.8 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and post review on Document Control Software. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
 - 1. Make correction as noted.
 - 2. No exception taken.
 - 3. Revise and Resubmit.
 - 4. Reject.
 - 5. Submit Specified Item.
- B. Informational Submittals: Architect will review each submittal and will post submittal review on Document Control Software only if it does not comply with requirements.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals received from sources other than Contractor will be returned by the Architect without action or may be discarded.
- F. Submittals not required by the Contract Documents will be returned by the Architect without action or may be discarded.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION (Not Used)****END OF SECTION 01 33 00**

**SECTION 01 39 00
PROJECT FORMS**

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 standardized forms to be used for this project. Examples of forms used in District's document control software are provided at the end of this Section.
- B. Listing of project forms:
 - 1. Application for Payment, Periodic Payment and Continuation Sheet.
 - 2. Allowance Payment Record (APR).
 - 3. Field Work Order (FWO).
 - 4. Schedule of Values (SOV); used only when cost-loaded Critical Path Method Schedule is not required.
 - 5. Architect's Supplemental Instructions (ASI).
 - 6. Request for Information (RFI).
 - 7. Submittal Register.
 - 8. Contractor's Master Key Responsibility Agreement.
 - 9. Inspection Request.
 - 10. Notice of Deviations (DSA Form 154; for DSA Projects only).
 - 11. Non-Compliance Notice (District Form).
 - 12. Request for Proposal (RFP).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 FORMS

- A. Images of sample forms are included beginning on page 01 39 00 - 3.
- B. Obtain editable versions of forms from District Construction Manager.



Certificate of the Contractor or His Duly Authorized Representative

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction / Physical Plant Operations
4860 Ruffner St San Diego, CA 92111-1522

I certify that all items, units, quantities and prices of work and material shown on Sheet No.(s) _____ of this Periodic Estimate are correct; that all work has been performed and materials supplied in accordance with the terms and conditions of Contract No. **CONTRACT NUMBER**, between the San Diego Unified School District and **GEN VENDORNAME TB** dated **Dec 31, 1999** and all authorized changes thereto, that all of the terms and conditions of said contract required to have been met as of the date hereof have been fully complied with; that the following is a true and correct statement of the contract account up to and including the last day of the period covered by this estimate, and that no part of the Amount Due: has been received.

Project: -

Application No.:

Period To:

Contract Title:

PeopleSoft PO #:

1. ORIGINAL CONTRACT SUM	\$999,999.00
2. Net Change by Change Orders	\$999,999.00
2a. NTP Revisions	\$999,999.00
3. CONTRACT SUM TO DATE (Line 1 + 2)	\$999,999.00
4. TOTAL COMPLETED & STORED TO DATE	\$999,999.00
(Column G on G703)	
5. RETAINAGE:	
Retainage is held at a rate of 5% until final payment	
Total Retainage	\$999,999.00
6. TOTAL EARNED LESS RETAINAGE	\$999,999.00
(Line 4 less Line 5 Total)	
7. LESS PREVIOUS PAID ON CERTIFICATES FOR	
PAYMENT	\$999,999.00
(Line 7 + Line 10 from prior month certificate)	
8. TOTAL ADD/DEDUCTIVE AMOUNTS	(\$0.00)
(Stop Notices, Non-Compliance, Insurance Certs)	
9. ADJUSTED PAYMENT DUE THIS PERIOD	\$999,999.00
10. BALANCE TO FINISH, INCLUDING RETAINAGE	
(Line 3 less Line 6)	\$999,999.00

Labor Compliance:	(\$999,999.00)
Stop Notices:	(\$999,999.00)
Back Charges:	(\$999,999.00)
Liquidated Damages:	(\$999,999.00)
Insurance Certs:	(\$999,999.00)
Total Adjustments:	(\$999,999.00)

Contractor: _____ By: _____

Date: _____ Title: _____

CERTIFICATE OF OWNER'S SUPERVISING REPRESENTATIVE OR ARCHITECT/ENGINEER OF RECORD

I certify that I have verified this Periodic Estimate, that to the best of my knowledge and belief this is a true and correct statement of work performed and material supplied by the Contractor; that the Contractor's certified statement of his account and the amount due him is correct and just; and that all contractual obligations including in this Periodic Estimate have been performed in full accordance with the terms and conditions of the contractual documents and authorized changes thereto.

Name: _____ By: _____

Date: _____ Title: _____

CERTIFICATE OF OWNER'S INSPECTOR

I certify that all work and material included in the Periodic Estimate have been inspected by me and have been found to comply with the terms and conditions of the contractual documents and authorized changes thereto.

Name: _____ Date: _____

Project Inspector

APPROVED FOR PAYMENT

By: _____ Date: _____ By: _____ Date: _____
Director Manager

uuu_56:DV_PayApp



Change Order

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction / Physical Plant Operations
4860 Ruffner St. San Diego, CA 92111-1522

Project:		Change Order #:	
Architect:		Date:	
Contractor:		DSA #:	
Title:		Contract:	
PeopleSoft PO #:		Project #:	

Directions to Contractor: You are not to proceed with modifications to the contract documents described herein until authorized by SDUSD. The price for this Change Order is full and complete compensation for any and all; (1) overhead incurred as a result of performing said changes; (2) delays in the completion of the project incurred as a result of performing said changes; (3) all equipment, materials, labor, field and home office overhead, indirect and direct consequential costs, mark-ups and profit necessary to complete the work. By executing this contract change order, the contractor agrees to proceed with this work as a change order per the general and supplemental conditions of the contract and waives any rights to additional compensation arising out of the work listed in this change order, including without limitation, any claims relating to any cumulative effects of change orders, delays, productivity impact or interruption.

Description

Justification Reason Code:

Original Contract Value: \$
 The Contract Sum Prior to this Change Order was: \$
 The Contract Sum Will Be Increased/Decreased By: \$ Extra: \$
 The New Contract Sum Including This Change Order Is: \$ Credit: \$
 The Contract Time Is Changed By: Days \$

☐ THIS IS A UNILATERAL CHANGE ORDER. THE CONTRACTOR IS NOT REQUIRED TO SIGN THIS DOCUMENT.

Contractor Review _____ Date _____
 Architect Review _____ Date _____
 Construction Manager Review _____ Date _____
 Project Manager Review _____ Date _____
 Inspector Review _____ Date _____

WITH ACCEPTANCE SIGNATURE, THIS CHANGE ORDER MODIFIES THE CONTRACT BY THE AMOUNT AND TIME INDICATED AND THE CONTRACTOR IS AUTHORIZED TO PROCEED AS DIRECTED BY THE DISTRICT

Director, Construction Management Department Review _____ Date _____
 Chief, Facilities Planning & Construction Acceptance _____ Date _____

Board of Education approval required for individual Change Orders exceeding (1) 10% of the Contract value; or (2) \$500,000

Order by Board of Education, San Diego Unified School District _____ Date _____
 Board Action Officer

This change order is ____ of the contract. Cumulative CO Percentage ____



Change Order

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction / Physical Plant Operations
4860 Ruffner St. San Diego, CA 92111-1522

Project:		Change Order #:	
Architect:		Date:	
Contractor:		DSA #:	
Title:		Contract:	
PeopleSoft PO #:		Project #:	

Directions to Contractor: You are not to proceed with modifications to the contract documents described herein until authorized by SDUSD. The price for this Change Order is full and complete compensation for any and all; (1) overhead incurred as a result of performing said changes; (2) delays in the completion of the project incurred as a result of performing said changes; (3) all equipment, materials, labor, field and home office overhead, indirect and direct consequential costs, mark-ups and profit necessary to complete the work. By executing this contract change order, the contractor agrees to proceed with this work as a change order per the general and supplemental conditions of the contract and waives any rights to additional compensation arising out of the work listed in this change order, including without limitation, any claims relating to any cumulative effects of change orders, delays, productivity impact or interruption.

Description

Justification

Reason Code:

Original Contract Value (Tenant Improvements + Lease Payment):	\$		
The Contract Sum Prior to this Change Order was:	\$		
The Contract Sum Will Be Increased/Decreased By:	\$	Extra:	\$
The New Contract Sum Including This Change Order Is:	\$	Credit:	\$
The Contract Time Is Changed By:	Days		\$

☐

THIS IS A UNILATERAL CHANGE ORDER. THE CONTRACTOR IS NOT REQUIRED TO SIGN THIS DOCUMENT.

Contractor Review	_____	Date	_____
Architect Review	_____	Date	_____
Construction Manager Review	_____	Date	_____
Project Manager Review	_____	Date	_____
Inspector Review	_____	Date	_____

WITH ACCEPTANCE SIGNATURE, THIS CHANGE ORDER MODIFIES THE CONTRACT BY THE AMOUNT AND TIME INDICATED AND THE CONTRACTOR IS AUTHORIZED TO PROCEED AS DIRECTED BY THE DISTRICT

Director, Construction Management Department Review	_____	Date	_____
Chief, Facilities Planning & Construction Acceptance	_____	Date	_____

Board of Education approval required for Change Orders exceeding \$500,000

Order by Board of Education, San Diego Unified School District	_____	Date	_____
	Board Action Officer		

This change order is ____ of the contract. Cumulative CO Percentage ____



Allowance Payment Record

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction / Physical Plant Operations
4860 Ruffner St. San Diego, CA 92111-1522

Project:
Title:
To:

APR No.:
Date:
Contract No.:

Directions to Contractor

Please submit an itemized quotation for the allowable charges to be paid from the project allowance. If payment is for reimbursement of fees paid, attach copies of all invoices and cancelled checks.

Description of Fees Paid or Work Performed

Justification

Allowance Title:		
	Scheduled Value	\$0.00
	Pending APRs	\$0.00
	Prev. Paid Applications	\$0.00
	This APR	\$0.00
	Balance	\$0.00

Actions

Contractor Signature _____ Date: _____

Architect Review _____ Date: _____

Const. Mgr. Review _____ Date: _____

Inspector Review _____ Date: _____

Project Manager Review _____ Date: _____

Issued by

Director, Const. Mgmt. Dept. _____ Date: _____

**FIELD WORK ORDER**

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction / Physical Plant Operations
 4860 Ruffner St San Diego, CA 92111-1522

Project:
Title:

Field Work Order #:
Date:

To:

Contract #:
Inspector:
Req'd Start Date:

Directions to Contractor

This work is to be done on a documented time and material basis. Document all time, materials and equipment to the Project Inspector on a daily basis. Maintain a complete record of inspector signed daily documents for all costs for doing the work. The inspector signed documentation is required to be included in the CO that will follow. Notify the construction manager when you have reached 80% to 85% of the not to exceed figure below. Within fifteen (15) days the contractor is to furnish to the DISTRICT a detailed Price and/or time proposal in accordance with the contract documents. Upon receipt of this Field Work Order, the contractor shall promptly commence and proceed diligently with this work.

Description of Work to be Performed

Not to Exceed: \$0.00

Justification

Construction Manager: _____ Date:

Director, Construction Management: _____ Date:

Copy To: Architect, Project Manager, Project Inspector and Construction Office

NO. CP25-1029-52-00-00



CONTRACT NO:

SOV 02-2022

**ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS**

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction / Physical Plant Operations

4860 Ruffner St San Diego, CA 92111-1522

Title:**Project:****From:** San Diego Unified School District**To:****Attn:****ASI No.:****Date:****Contract No.:****DIRECTIONS TO CONTRACTOR****REMARKS****Signed:**

Architect: _____

Date: _____

Signed:

Contractor: _____

Date: _____

Copy To: Construction Manager, Project Inspector, Project Manager

uuu_36:DV_ASI



Request for Information

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction / Physical Plant Operations

4860 Ruffner St San Diego, CA 92111-1522

Project:

Title:

Contract No.

From:

To:

Plan Ref:

Document:

Sub Ref. No.:

Date:

Required Date:

Response Date:

Question:

Proposed Solution:

Answer:

SAMPLE

12/9/2023

**Submittal Register**

SAN DIEGO UNIFIED SCHOOL DISTRICT, Facilities Planning & Construction/Physical Plant Operations
4860 Ruffner Street, San Diego, CA 92111-1522

The Contractor is required to use the SDUSD Document Control Software (currently Unifier) to submit submittals to the Architect for review.

The Submittal Register creates the list of Submittals to be inputted into the Document Control Software (i.e. Unifier) for easy tracking.

This form is to be completed by the Contractor at the start of the project, and sent to the Architect for review.

All the information required to complete this form is in the Part 1 of each individual Contract Specification (i.e. 01 77 00 - 1.4).

The Contractor is to list separately all Action and Informational Submittals (and Warranties) listed in the individual Contract Specifications.

A	B	C	D	E	F	G	H	I
D	Group Name	Submittal Type	Contractor Submittal #	Item Number	Submittal Description	Reference Spec Section #	Sub-Section/ Paragraph	Submittal Category
D	Example	Construction	S021	1	Product Data	03 30 00	1.5A	Product Data
D	Example	Construction	S032	2	Shop Drawings	04 81 00	1.4B	Shop Drawing
D	Example	Construction	S043	4	Welding Certificates	05 40 00	1.4C	Certificate



CONTRACTOR'S MASTER KEY RESPONSIBILITY AGREEMENT

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction - Construction Management Department
4860 Ruffner St. San Diego, CA 92111-1522 (858) 637-6266

The undersigned Superintendent for the contract's General Contractor agrees to accept responsibility for the safekeeping and proper use of the school site's master key(s). On behalf of the General Contractor, the Superintendent also agrees that the District will be reimbursed for all costs associated with the re-keying of the school site if the contractor's set of master key(s) are lost or stolen. This form must be completed in order to receive key(s).

School: _____ Site Location #: _____

Project Name: _____ Date: _____

General Contractor: _____ Phone #: _____

DO NOT DUPLICATE OR RE-TAG ANY KEY(S) WITH SITE NAME. I UNDERSTAND THAT IF IT IS DETERMINED THAT KEY(S) HAVE BEEN DUPLICATED, OR REMOVED FROM THE CABLE, OR RE-TAGGED THE CONTRACTOR WILL BE CHARGED FOR RE-KEYING THE SITE.

ATTACH COPY OF DRIVER'S LICENSE AND KEY(S) ISSUED

Key(s) Numbers: _____

Signature: _____ Print Name: _____

Key(s) Issued By: _____
Authorized Lock Shop Rep. # Keys Authorized CM Dept. Rep.

To receive key(s), E-mail Sofia Martinez (smartinez4@sandi.net), Mark Stapledon (mstapledon@sandi.net), and Mattie Lewis (mlewis7@sandi.net) to schedule a day and time to pick up key(s) at the location below.

**SDUSD Physical Plant Operations Center
4860 Ruffner Street, San Diego, CA, 92111**

All keys must be returned to Sofia Martinez, Mark Stapledon, Mattie Lewis, or other pre-authorized Construction Management Department personnel at project completion. Any key(s) not returned will result in the withholding of up to \$60,000 from available funds for re-keying the site.

NOTICE: ALL SCHOOL SITES ARE ALARMED! When entering a school site after regular school hours, the Superintendent is required to notify School Police at 619-291-7678 upon entry. Provide the dispatcher with the name of the General Contractor, and the names of the workers entering the area. School Police are to be notified when leaving the site, and the Superintendent has verified that the work area has been fully secured.

Date Key(s) Returned: _____ Print Name: _____

Received By: _____ Print Name: _____

Authorized CM Dept. Rep.
Authorized Lock Shop Representative

RETURN COPY OF DRIVER'S LICENSE **KEYS ARE TO REMAIN CABLED FOR SECURITY PURPOSES**

Estimated Date of Key(s) Return: _____

Revision: 12/05/22

SPECIFICATIONS

NO. CP25-1029-52-00-00



INSPECTION REQUEST

REQUEST NO.:

SAN DIEGO UNIFIED SCHOOL DISTRICT 4860 Ruffner St. San Diego, CA 92111-1522

DATE: 6/2/2017

PROJECT:
INSPECTOR:
INSPECTION BY:

TITLE:
CONTRACT #:
VENDOR:
REFERENCE DSA #:
INSPECTION NEEDED BY:
REFERENCE SPEC SECTION #:

OTHER DOCUMENTS AFFECTING THIS PORTION OF WORK (ASI, RFI, CCD, etc)

INSPECTION TYPE REQUESTED:

INSPECTOR NOTES:

RESULTS

PASSED?

RE-INSPECTION REQUIRED?

Certified By: <?INSPECTOR?>

Date: <?COMPLETION_DATE?>

**San Diego Unified School District**

MAINTENANCE & OPERATIONS CENTER

(858) 637-6266—Telephone

(858) 496-1953—Fax

FACILITIES MANAGEMENT

Construction Management Department

NON-COMPLIANCE NOTICE

PROJECT: [REDACTED] NUMBER: [REDACTED]
INSPECTOR: [REDACTED] DATE: [REDACTED]
CONTRACTOR: [REDACTED] ISSUED TO: [REDACTED]
SUPERINTENDENT: [REDACTED]

NATURE OF NON-COMPLIANCE:

[REDACTED]

SPEC. REF.: [REDACTED] PLAN SET: [REDACTED]

CODE REF.: [REDACTED]

CONTRACTOR'S RESPONSE:

[REDACTED]

DATE CORRECTIVE ACTION STARTED: [REDACTED] COMPLETED: [REDACTED]

ARCHITECT'S APPROVAL OF CORRECTION: [REDACTED]

INSPECTOR'S APPROVAL OF CORRECTION: [REDACTED]

RESOLUTION/REMARKS:

[REDACTED]

cc: Architect, DCS, CM

All San Diego students will graduate with the skills, motivation, curiosity and resilience to succeed in their choice of college and career in order to lead and participate in the society of tomorrow.

Rev : 03/04/2023



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NOTICE OF DEVIATIONS / RESOLUTION OF DEVIATIONS

This form shall be completed by the Project Inspector, in accordance with California Code of Regulations, Title 24, Part 1, Section 4-342(b)(6). The Project Inspector shall provide a copy to the contractor, the architect/engineer and DSA.

School District/Owner:		DSA File #:	-
Project Name/School:		DSA App. #:	-
From: (Name of Project Inspector)		DSA Certification #:	DSA 152 Card Number(s): (List all inspection card numbers for which this notice applies.)
To: (Name of Contractor)			
Notice #:	Date of Notice:		
<p>Note that DSA-approved construction documents, referred to below, are those portions of the construction documents, duly approved by the DSA, that contain information related to and affecting the Structural Safety, Fire/Life Safety and Accessibility portions of the project.</p>			
1. REASON FOR NOTICE (Check applicable box.)			
<input type="checkbox"/> Deviations from DSA-approved construction documents. (Complete Section 2.)			
<input type="checkbox"/> Resolution of previously notified deviations. (Complete Sections 2 and 3.)			
2. NOTIFICATION OF DEVIATIONS			
<p>The following deviations have been brought to the contractor's attention and have not been corrected. Written notice is now being given and the deviations must be corrected prior to Project Inspector acceptance of the affected work. When all deviations have been corrected, the affected work must be re-inspected and Section 3 of this form completed by the Project Inspector.</p>			
Description of Deviations		Plan Reference / Specification Section	
<p>The project inspector shall contact DSA by email at least 48 hours prior to scheduled work covering up uncorrected deviations.</p>			
3. PROJECT INSPECTOR VERIFICATION OF RESOLUTION OF DEVIATIONS			
<p>All deviations noted above have been corrected and the affected work is in compliance with the DSA approved construction documents.</p>			
NAME OF PROJECT INSPECTOR:		SIGNATURE:	DATE:
<p>Submit completed form electronically to the DSA Regional Office with construction oversight authority for the project (see DSA Procedure PR 13-01).</p>			

**Request for Proposal**

SAN DIEGO UNIFIED SCHOOL DISTRICT Facilities Planning & Construction / Physical Plant Operations
4860 Ruffner St San Diego, CA 92111-1522

Title:**Date:****Project:****Job:****To:****Contract No:****Directions to Contractor**

Please submit and attach an itemized quotation within 15 calendar days for changes in the contract sum and/or time incidental to proceed with modifications to the contract documents described herein. You are not to proceed with the work until authorized by SDUSD. The submitted price for this Change Order is to be full and complete compensation to the contractor for performance of the change described below, and includes, but is not limited to compensation for any and all; (1) overhead incurred as a result of performing said changes; and (2) delays in the completion of the project incurred as a result of performing said changes.

Description of Change

By: _____ **Date:** _____

SPECIFICATIONS

NO. CP25-1029-52-00-00

END OF SECTION 01 39 00

SECTION 01 40 02**QUALITY REQUIREMENTS, CONTRACTOR LABORATORY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control related to tests and inspections performed by Contractor's Testing Agency.
- B. Testing and inspection services specified in this Section will be performed by a Testing Agency selected and employed by the Contractor.
- C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by other Sections are not limited by provisions of this Section.
 - 4. Specific tests and inspections are not specified in this Section.
- D. Related Requirements:
 - 1. Section 01 73 00 "Execution."

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the

QUALITY REQUIREMENTS, CONTRACTOR LABORATORY**01 40 02 - 1****KITCHEN MODIFICATIONS GROUP 6**

Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by District.

- C. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- D. Testing Agency: For this Section, an entity engaged by the Contractor to perform specific tests, inspections, or both.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: Provide or perform quantity or quality level shown or specified. Comply exactly with the minimum quantity or quality specified, or exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect before proceeding.

1.5 INFORMATIONAL SUBMITTALS

- A. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of three recent test reports issued by the Testing Agency on projects of comparable size and complexity.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Number of tests and inspections required.
 - 5. Time schedule or time span for tests and inspections.
 - 6. Requirements for obtaining samples.

1.6 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.

3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
11. Name and signature of laboratory inspector.
12. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.7 QUALITY ASSURANCE

- A. Testing and inspection services which are performed will be in accordance with requirements of CBC Title 24 Part 1, Administrative Code, where applicable.
- B. Testing and inspection services will verify that work meets the requirements of the Contract Documents.

- C. Provide test reports signed by a Registered Engineer licensed in the State of California for the specific type of testing required.
- D. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- E. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- F. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to District Construction Manager and Project Inspector. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - 1. Notify Architect, District Construction Manager, Project Inspector and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - 2. Submit a certified written report of each test, inspection, and similar quality-control service to Architect, District Construction Manager, and Project Inspector, with copy to Contractor.
 - 3. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - 4. Retest and reinspect corrected work.
 - 5. Cooperate with Architect, District Construction Manager, Project Inspector, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 6. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 - 7. Do not perform any duties of the Contractor.
- G. Test reports will include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested will also be reported. Records of special sampling operations as required will be reported. The reports will show that the material or materials were sampled and tested in accordance with the requirements of the Contract Documents. They will also state definitely whether or not the material or materials tested comply with requirements.
- H. Reporting Test Failures:
 - 1. Immediately upon Testing Agency determination of a test failure, the Agency will notify the District Construction Manager by either telephone or e-mail. On the same day, the Testing Agency will send written test results to the Architect, District Construction Manager, Project Inspector, and Contractor.

1.8 PAYMENTS

- A. Pay for costs of initial testing and inspection, except as specifically modified herein, or specified otherwise in technical sections. Initial tests and inspections are defined as the first tests and inspections as herein specified.
- B. In the event a test or inspection indicates failure of a material or procedure to meet requirements of Contract Documents, pay for costs for retesting and additional work related to failure at no additional expense to the District.
- C. Additional tests and inspections, not herein specified but requested by District, will be paid by District unless results of such tests and inspections are found to be not in compliance with Contract Documents, in which case the District will pay all costs for initial testing as well as retesting and reinspection. District will then backcharge the Contractor for these costs.
- D. At no additional expense to the District, pay for costs for additional tests or inspections required because Contractor changed materials or changed source or supply.
- E. At no additional expense to the District, pay for costs of tests or inspections that are required to correct deficiencies.
- F. At no additional expense to the District, pay for extra Testing Agency expenses resulting from a failure to notify the Testing Agency.
- G. At no additional expense to the District, pay for charges due to insufficient advance notice of cancellations or time extension.
- H. Cost of testing that is required solely for the convenience of Contractor in his scheduling and performance of work shall be paid by the Contractor.
- I. At no additional expense to the District, pay for overtime costs of testing and inspections performed outside the regular work day hours, including weekends and holidays. Such costs include overtime costs for the District's Representative.
- J. Should it be considered necessary or advisable by the District at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out the completed work, promptly furnish necessary facilities, labor and materials. If such work is found to be defective in any respect due to fault of the Contractor or his subcontractor, pay for all expenses of such examinations and of satisfactory reconstruction at no additional cost to the District. If, however, such work is found to meet the requirements of the Contract, District will reimburse to the Contractor additional cost of labor and material necessarily involved in the examination and replacement.

1.9 QUALITY CONTROL

- A. Contractor Responsibilities:

1. Engage a qualified testing agency to perform these quality-control services.
 - a. Do not employ same entity engaged by District.
 2. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Pay for costs of retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents.
- B. Contractor Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify Testing Agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field-curing of test samples.
 5. Preliminary design mix proposed for use for material mixes that require control by Testing Agency.
 6. Security and protection for samples and for testing and inspecting equipment at Project site.
 7. Selection of the material required to be tested will be by the Testing Agency or the District's Representative and not by the Contractor.
- C. Notify the Testing Agency a minimum of 3 working days in advance of the manufacture of material to be supplied under the Contract Documents, which must by terms of the Contract be tested. Agency will arrange for the testing of such material at the source of supply.
1. Do not incorporate into the Project material shipped by the Contractor from the source of supply before having satisfactorily passed such testing and inspection or before the receipt of notice from the District that such testing and inspection will not be required.
- D. Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."

- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule concurrently with Project Baseline Schedule.
 - 1. After District review, distribute schedule to District Construction Manager, Project Inspector, Testing Agency, and each party involved in performance of portions of the Work where tests and inspections are required.
 - 2. Give sufficient advance notice to Testing Agency in the event of cancellation or time extension of a scheduled test or inspection.

1.10 PROJECT INSPECTOR

- A. An Inspector employed by the District will be assigned to the Work.
- B. Notify the Inspector a minimum of two working days in advance of execution of all work that requires inspection.
- C. The work of construction in all stages of progress is subject to the personal continuous observation of the Inspector. Provide Inspector with free access to any or all parts of the work at any time. Provide Inspector with reasonable facilities for obtaining such information as may be necessary for the Inspector to be fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work does not relieve the Contractor from any obligation to comply with the Contract requirements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to District Construction Manager.
 - 4. Identification of Testing Agency conducting test or inspection.

- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for District's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 02

SECTION 01 42 00**REFERENCES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the General Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the General Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete in place and ready for the intended use.
- I. "City": City of San Diego, unless specified otherwise.
- J. "Includes", "Including", and variations thereof: "Includes, but not limited to,..."

REFERENCES**01 42 00 - 1****KITCHEN MODIFICATION GROUP 6**

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
- D. Sources for complete titles of individual Industry Standards:
 - 1. Internet search engines
 - 2. United Master Reference List (UMRL) at <https://www.wbdg.org/FFC/DOD/UMRL/UMRL.pdf>.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Abbreviations and acronyms are to mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States." For abbreviations and acronyms not included in these references, use internet search engine according to appropriate context and subject matter.
- B. Industry Organizations, Code Agencies, Federal and State Government Agencies, Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities.
- C. Where duplicates occur, use according to appropriate context and subject matter.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION (Not Used)****END OF SECTION 01 42 00****REFERENCES****01 42 00 - 2****KITCHEN MODIFICATION GROUP 6**

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.
 - 2. Section 31 23 19 "Dewatering" for disposal of ground water at Project site.

1.3 USE CHARGES

- A. General: Installation, removal of, maintenance, cleaning, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in project to use temporary services and facilities without cost, including District, Architect, testing agencies, and authorities having jurisdiction.
 - 1. Water Service: Pay water-service use charges for water used by all entities for construction operations.
 - 2. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

1.4 SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Project Identification and Temporary Signs: Show materials, fabrication, fasteners, attachment methods, and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

- C. Moisture-Protection Plan as specified herein.
- D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste handling procedures.
 - 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Moisture-Protection: Protect materials and construction from water absorption and damage. Protect during delivery, handling, and storage. Discard water-damaged materials, mitigate water intrusion into completed Work, and replace water damaged Work.
- C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- D. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and CBC.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before District's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 8 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.

1. Provide securely fastened continuous screening fabric on portable chain link fence.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

2.2 TEMPORARY FACILITIES

- A. All field offices and sanitary facilities must comply with applicable codes and regulations, including disabled accessibility regulations.
- B. District Field Offices:
 1. Field Offices and Sanitary Facilities: The District does not require field offices or sanitary facilities for this Project.
- C. Contractor's Field Office and Sanitary Facilities:
 1. The Contractor's Field Office: Equip with lockable entrances, operable windows and serviceable finishes, and heating and ventilation on foundations adequate for normal loading. Provide adequate space for a conference table with sufficient seating for ten (10) people. Provide the sanitary facilities, wash facilities and drinking water as required by applicable codes and regulations.
- D. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations. Store combustible materials away from building(s).
- E. Temporary Signs
 1. Provide signs as indicated and as required to inform and protect public and individuals seeking entrance to Project.
 2. Provide temporary, directional and caution signs for construction personnel and visitors.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless District authorizes use of existing permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.

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2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency and marked for intended location and application.
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION**3.1 TEMPORARY FACILITIES, GENERAL**

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
- C. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Connect to existing service.
 1. Arrange with utility company, District, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- C. Water Service: Connect to District's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to District. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

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- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas. Isolate work area from occupied areas of building.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide construction for temporary offices, shops, and sheds located within construction area.
 - 2. Maintain support facilities until Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain prior written permission from the District.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

- C. Site Enclosure Fence: Before construction operations begin, provide site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.
- D. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
 - 1. Provide and maintain temporary barricades at all hazardous areas to protect both pedestrians and vehicles at all times. This protection shall be for students, faculty and all others at both offsite and onsite work. Adjust and relocate barricades as necessary for protection as work progresses to different locations. Areas that require barricades include such things as trenches, changes to sidewalks/driveways and projections above ground.
- F. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- H. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by District from fumes and noise.
 - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 - 2. Construct dustproof partitions with two layers of 6-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
 - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.

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3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 4. Insulate partitions to control noise transmission to occupied areas.
 5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 6. Protect air-handling equipment.
 7. Provide walk-off mats at each entrance through temporary partition.
- I. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking on District property.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 3. Avoid trapping water in finished work. Indicate methods to be used to avoid trapping water in finished work.
 4. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.

- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use permanent HVAC system to control humidity.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to the District Construction Manager.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. District reserves right to take possession of Project identification signs.
 - 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 - 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

**SECTION 01 60 00
PRODUCT REQUIREMENTS**

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and "or equal" products.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for products selected under an allowance.
 - 2. Section 01 25 00 "Substitution Procedures" for requests for substitutions.
 - 3. Section 01 42 00 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. "or equal" Product: Product that is demonstrated and approved through the substitution request process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed

to establish significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating "or equal" products of additional manufacturers.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to District.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for District.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS**2.1 PRODUCTS NOT ALLOWED**

- A. Do not provide products that contain asbestos, lead, or coal tar.

2.2 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. District reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.

5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. For products specified by name and accompanied by the term "or equal," comply with requirements of Section 01 25 00 "Substitution Procedures" to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Where Specifications name a single manufacture's product and indicate "no substitution", provide the named product that complies with requirements. "or equal" products (substitutions) will not be considered.
2. Where Specifications name a single manufacturer or source and indicate "no substitution", provide a product by the named manufacturer or source that complies with requirements. "or equal" products (substitutions) will not be considered.
3. Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. "or equal" products (substitutions) will be considered.
4. Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. "or equal" products (substitutions) will be considered unless expressly specified otherwise.
5. Basis-of-Design Product: Where Specifications name a product as the basis-of-design product, or refer to a product indicated on Drawings as the basis-of-design product, provide the specified or indicated product. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. "or equal" products (substitutions) will be considered.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select features such as color, gloss, pattern, density, texture from manufacturer's product line.

PART 3 - EXECUTION

3.1 COLOR CONSISTENCY

- A. All like finish products within a given visible area shall be from the same dye lot or color run.
- B. If like finish products within a given visible area vary slightly in color, mix and blend varying colors to avoid distinct areas of color variation.

END OF SECTION 01 60 00

SECTION 01 73 00**EXECUTION****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 general administrative and procedural requirements governing execution of the Work, including the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of District-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for limits on use of Project site.
 - 2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
 - 3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of District-accepted deviations from indicated lines and levels, and final cleaning.
 - 4. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

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1.4 PREINSTALLATION MEETINGS

1. Cutting and Patching Conference: Conduct conference at
 - a. Clairemont High School. 4150 Ute Dr, San Diego, CA 92117
 - b. Bell Middle School. 620 Briarwood Rd, San Diego, CA 92139
2. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
 - a. Contractor's superintendent.
 - b. Trade supervisor responsible for cutting operations.
 - c. Trade supervisor(s) responsible for patching of each type of substrate.
 - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affecting by cutting and patching operations.
3. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 ACTION SUBMITTALS**A. Cutting and Patching Request**

1. Submit Cutting and Patching Plan describing procedures at least 10 days prior to the time cutting and patching will be performed.
2. Include the following information:
 - a. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - b. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - c. Products: List products to be used for patching, including product data and patching details, and firms or entities that will perform patching work.
 - d. Dates: Indicate when cutting and patching will be performed.
 - e. Contractor's stamp, Contractor's name, Project location and name, Contractor's signature acknowledging review of Cutting and Patching Request, including Cutting and Patching Plan.
 - f. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - 1) Include description of provisions for temporary services and systems during interruption of permanent services and systems.

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3. Obtain District Construction Manager's approval prior to commencing cutting and patching work. Approval does not waive District's right to require removal and replacement of unsatisfactory cutting and patching work.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Qualification Data: For franchise utility project manager.
- C. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- D. Landfill Receipts: Submit copies of waste hauler slips indicating the amount of waste hauled in tons and the amount of waste in tons diverted from landfill and recycled, composted or salvaged.
- E. Certified Surveys: Submit two copies signed by land surveyor.
- F. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.7 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in California and who is experienced in providing land-surveying services of the kind indicated.
- B. Franchise Utility Project Manager Qualifications: A qualified franchise utility project manager/coordinator with a minimum of 10 years' experience in project management with utility agencies (SDG&E, SBC Global, Cox Cable, Time Warner, etc.). Duties shall include administering and coordinating all aspects of the administration of the franchise utility work including contractor self-performed work.
- C. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 1. Structural Elements: When cutting and patching structural elements, notify the District Construction Manager of locations and details of cutting, and await directions from the District Construction Manager before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

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- a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
 - m. Weather barriers.
 - n. Thermal protection systems, including insulation assemblies.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include the following:
- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in the District Construction Manager's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

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1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site to District Construction Manager 10 days prior to start of work.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine surfaces, substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 1. Description of the Work.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

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3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and District Construction Manager that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify the District Construction Manager promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify the District Construction Manager when deviations from required lines and levels exceed allowable tolerances.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for

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mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and project Inspector.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, survey monuments, temporary control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and survey monuments during construction operations.
 - 1. If any existing permanent benchmark will be destroyed as a result of construction, notify District Construction Manager in writing before such destruction occurs. Do not disturb benchmark until City forces have established necessary control to set a new permanent benchmark and District Construction Manager has given written permission to proceed.
 - 2. If any survey monument will be destroyed as a result of construction, before such destruction occurs, notify District Construction Manager in writing. Engage a Land Surveyor to survey as necessary and prepare Pre-construction Corner Record complying with the California Professional Land Surveyors Act. Section 8771. File Pre-construction Corner Record with San Diego County Surveyor. Send a copy of preliminary Corner Record to District Construction Manager. Do not disturb survey monument until Pre-construction Corner Record is received and accepted by County and written permission is obtained from District Construction Manager. After lost monument has been replaced, engage a Land Surveyor to file a final Corner Record (or a Record of Survey if required) with San Diego County Surveyor.
- B. Benchmarks: Establish and maintain a minimum of two temporary benchmarks on Project site, referenced to data established by survey control points.
 - 1. Record temporary benchmark locations, with horizontal and vertical data, on Project Record Drawings.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

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1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the District Construction Manager.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use only products, cleaners, and installation materials that are not considered hazardous.

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- K. Underground Detectable Warning Tapes: Ensure that completed work provides fully functional underground detectable warning tapes per requirements specified in other Sections.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces and assemblies to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials, assemblies, and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping.
 - 2. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Cut or form holes for penetrations accurately to allow for proper sealing. Temporarily cover openings when not in use.
 - 3. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 4. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 5. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

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KITCHEN MODIFICATIONS GROUP 6

6. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 7. Proceed with patching after construction operations requiring cutting are complete.
- H. Notify District Construction Manager 48 hours prior to closing openings. Allow Inspector to view conditions prior to closing.
- I. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance. Replace ceiling tiles damaged by cutting and patching work.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- J. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

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3.7 DISTRICT-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for District's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by District's construction personnel.
 - 1. Construction Schedule: Inform District of Contractor's preferred construction schedule for District's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify District if changes to schedule are required due to differences in actual construction progress.
 - 2. Preinstallation Conferences: Include District's construction personnel at preinstallation conferences covering portions of the Work that are to receive District's work. Attend preinstallation conferences conducted by District's construction personnel if portions of the Work depend on District's construction.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not

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recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls. Section 01 74 19 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 02 "Quality Requirements , Contractor Laboratory."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

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- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 74 19**CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 02 41 16 "Structure Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements.
 - 2. Section 02 41 19 "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.
 - 3. Section 31 10 00 "Site Clearing" for disposition of waste resulting from site clearing and removal of above - and below-grade improvements.

1.3 DEFINITIONS

- A. Source Separated Recycling Facility (SSRF): A facility that exclusively accepts separated individual commodities for the purpose of recycling; such as metals, paper, wood, and/or inerts such as asphalt and concrete.
- B. Mixed Debris: Includes solid items such as building materials, packaging, and rubble resulting from construction, remodeling, repair, and demolition operations. One mixed debris processing facility is located in San Diego County at EDCO, 6670 Federal Blvd, Lemon Grove, CA 91945, herein referred to as the EDCO Mixed Debris Recycling Facility.
- C. Class III Landfill: A landfill that accepts non-hazardous waste such as household, commercial, and industrial waste.
- D. Administrative Recycling Program: Separation and recovery of paper and beverage containers from both permanent administrative offices and construction site office(s).

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- E. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- F. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- G. 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.
- H. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- I. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- J. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Clearly label all recycling containers and list acceptable and unacceptable materials. Deliver recyclable materials to source separated recycling facilities. Facilitate recycling and salvage of materials, including the following as applicable:
 - 1. Demolition Waste:
 - a. Asphalt paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Concrete masonry units.
 - e. Wood studs.
 - f. Wood joists.
 - g. Plywood and oriented strand board.
 - h. Wood paneling.
 - i. Wood trim.
 - j. Structural and miscellaneous steel.
 - k. Rough hardware.
 - l. Roofing.
 - m. Insulation.
 - n. Doors and frames.
 - o. Door hardware.
 - p. Windows.

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- q. Glazing.
- r. Metal studs.
- s. Gypsum board.
- t. Demountable partitions.
- u. Equipment.
- v. Plumbing fixtures.
- w. Piping.
- x. Valves.
- y. Sprinklers.
- z. Mechanical equipment.
- aa. Refrigerants.
- bb. Electrical conduit.
- cc. Copper wiring.
- dd. Lighting fixtures.
- ee. Lamps.
- ff. Electrical devices.

2. Construction Waste:

- a. Masonry and CMU.
- b. Lumber.
- c. Wood sheet materials.
- d. Wood trim.
- e. Metals.
- f. Roofing.
- g. Insulation.
- h. Gypsum board.
- i. Piping.
- j. Electrical conduit.
- k. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.

- B. Co-mingled Debris: Direct all co-mingled site tonnage to the EDCO Mixed Debris Processing Facility.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 10 days of date established for the Notice to Proceed.

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1.6 INFORMATIONAL SUBMITTALS

- A. SDUSD Contractor Summary Site Debris Diversion Report: Concurrent with each Application for Payment, submit report. Use District Form CSDDR-1, attached at the end of this Section. The District Construction Manager will provide an editable version. *Failure to include Report will result in a 10 percent withholding of payment.*
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Qualification Data: For Waste Management Coordinator.
- H. Disposal Manifests:
 - 1. Original manifests and receipts acknowledging disposal of all hazardous and non-hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.
 - a. Submit within 30 days of date that material was transported off site.

1.7 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Prior to commencement of work, conduct conference at Project site. Attendees shall include District Construction Manager, Waste Management Coordinator, and Contractor personnel involved in demolition and waste handling. Review methods and procedures related to waste management, including:
 - 1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.

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2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.8 SITE DEBRIS MANAGEMENT PLAN

- A. General: Develop a site debris management plan. Use District Form CSDMP-1, attached at the end of this Section. The District Construction Manager will provide an editable version. Use a separate form for each project phase (land clearing, demolition, construction).
- B. Post approved plan in a prominent location at the Project site and distribute copies to superintendent and all subcontractors.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at the Project site full time during land clearing and demolition phases, and part time as needed during construction phase.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

- D. 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 on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 FORMS

- A. See following pages.

FORM CSDMP-1
SDUSD CONTRACTOR SITE DEBRIS MANAGEMENT PLAN (CSDMP)

Complete a separate form for each project phase (i.e. demolition, land clearing, construction)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		
Date Submitted:		

Reuse, Recycling or Mixed Debris Processing Processes Used

Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that are estimated for reuse and recycling below:

- 01 - Reuse of building materials or salvage items on site (i.e. fencing or red clay brick)
- 02 - Salvaging building materials or salvage items at an offsite salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an offsite recycling center (i.e. scrap metal or green mats)
- 05 - Recycling commingled loads of C&D mats at EDCO Mixed Debris Recycling Facility
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 09 - Other (please describe) _____

Types of Material Generated

Use these codes to indicate the types of material that are estimated to be generated on the project

A = Asphalt C = Concrete 1. M = Metals I = Mixed Inert G = Green Mats
D = Drywall P/C=Paper/Cardboard W/C = Wire/Cable S= Soils (Non Hazardous)
M/C = Miscellaneous Construction Debris R = Reuse/Salvage W = Wood O = Other (describe)

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units). Provide weight slips or load tickets for each load delivered.

SECTION I - RE-USED/RECYCLED MATERIALS

Include all proposed recycling activities for source separated recycling centers.

Type of Material	Type of Activity	Facilities Used/ Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, National City	24	355		
a. Source Separated Diversion			0	0	0	0

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FORM CSDMP-1 (Continued)
SDUSD CONTRACTOR SITE DEBRIS MANAGEMENT PLAN (CSDMP)

SECTION II - MIXED DEBRIS PROCESSING MATERIALS						
<i>Include estimates of all debris generated from activities where no source separated recycling will occur.</i>						
Type of Material	Type of Activity	Facilities Used/ Location	Total Truck Loads	2. Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M/C	5	EDCO Mixed Debris Recycling Facility	2	35		

SECTION III - TOTAL MATERIALS GENERATED EDCO			
<i>This section calculates the total materials recycled verses the total materials disposed for mixed debris sent to EDCO</i>			
	<i>Tons Recycled (tons x 0.80)</i>	<i>Tons Disposed (tons x 0.20)</i>	
a. EDCO			

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION			
<i>Add totals from Section I + Section II +Section III</i>			
		Tons	Cubic Yards
a. Materials Re-Used and Recycled (Section I + II +III)			
3. b. EDCO Disposal (Section III)			
c. Total Materials Generated (a. + b. = c.)			
d. Landfill Diversion Rate (a/c = d Tons Only)*			

* Use tons only to calculate recycling percentages: $\text{Tons Reused/Recycled/Tons Generated} = \% \text{ Recycled}$

Contractor's Comments (<i>Provide any additional information pertinent to planned reuse, recycling, or disposal activities</i>):

Notes:

- EDCO will recover 80% of the mixed debris for the purposes of recycling. Therefore, multiply tonnage by 0.80 for tons recycled and multiply tonnage by 0.20 for total project disposal.
- Suggested Conversion Factors: From Cubic Yards to Tons
 - Asphalt: 0.61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
 - Concrete: 0.93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
 - Ferrous Metals: 0.22 (ex. 1000 CY Ferrous Metal = 220 tons)
 - Non-Ferrous Metals: 0.10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
 - Drywall Scrap: 0.20
 - Wood Scrap: 0.16

Section B: Plan Narrative -- Methods to Ensure Diversion

Describe the method to be used to reuse and recycle (methods shall include one or more of the following: deconstruction to salvage all or most materials generated, selective salvage with source separation, and/or reuse of materials onsite):

Describe methods to be used to provide onsite instruction regarding appropriate separation, handling, recycling, salvage, reuse and return methods to achieve waste reduction goals.

Describe methods to be used to protect materials to be recycled from contamination. Including schedule of regular clean-up, schedule visual inspections of dumpsters and recycling bins to identify potential contamination of materials.

How will materials be stored and how much space will be required?

Describe your administrative recycling program.

FORM CSDDR-1

SDUSD CONTRACTOR SUMMARY SITE DEBRIS DIVERSION REPORT (CSDDR)

(Submit With Each Progress Payment)

Project Title:						
Contract or Work Order No.:						
Contractor's Name:						
Street Address:						
City:				State:		Zip:
Phone: ()				Fax: ()		
E-Mail Address:						
Prepared by: (Print Name)						
Date Submitted:						
Period Covered:		From:		To:		
Reuse, Recycling or Mixed Debris Processing Processes Used						
Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:						
01 - Reuse of building materials or salvage items on site (i.e. fencing or red clay brick)						
02 - Salvaging building materials or salvage items at an offsite salvage or re-use center (i.e. lighting, fixtures)						
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)						
04 - Recycling source separated materials at an offsite recycling center (i.e. scrap metal or green matls)						
05 - Recycling commingled loads of C&D matls at EDCO Mixed Debris Recycling Facility						
06 - Recycling material as Alternative Daily Cover at landfills						
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).						
09 - Other (please describe) _____						
Types of Material Generated						
Use these codes to indicate the types of material that were generated on the project						
A = Asphalt		C = Concrete		M = Metals		I = Mixed Inert
D = Drywall		P/C=Paper/Cardboard		W/C = Wire/Cable		S= Soils (Non Hazardous)
						G = Green Matls
						O = Other (describe)
M/C = Miscellaneous Construction Debris		R = Reuse/Salvage		W = Wood		
Facilities Used: Provide Name of Facility and Location (City)						
Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period						
Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units). Provide weight slips or load tickets for each load delivered.						
SECTION I - RE-USED/RECYCLED MATERIALS						
Include all recycling activities for source separated recycling centers where recycling occurred.						
Type of Material	Type of Activity	Facilities Used/ Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, National City	24	355		
a. Source Separated Diversion			0	0	0	0

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

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KITCHEN MODIFICATIONS GROUP 6

FORM CSDDR-1 (Continued)
SDUSD CONTRACTOR SUMMARY SITE DEBRIS DIVERSION REPORT (CSDDR)

SECTION II - MIXED DEBRIS PROCESSING MATERIALS						
<i>Include all debris generating activities for materials that were not sent to source separated recycling facilities.</i>						
Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M/C	05	EDCO Mixed Debris Recycling Facility	2	35		
SECTION III - TOTAL MATERIALS GENERATED EDCO						
<i>This section calculates the total materials recycled verses the total materials disposed for mixed debris sent to EDCO</i>						
		<i>Tons Recycled (tons x 0.80)</i>	<i>Tons Disposed (tons x 0.20)</i>			
a. EDCO						
SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
				Tons	Cubic YD	Other Wt.
a. Materials Re-Used and Recycled (Section I + II + III)				0		
b. EDCO Disposal (Section III)				0		
c. Total Materials Generated (a. + b. = c.)				0		
d. Landfill Diversion Rate (a/c = d Tons Only)*						
<i>* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled</i>						
Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):						
Notes:						
4. EDCO will recover 80% of the mixed debris for the purposes of recycling. Therefore, multiply tonnage by 0.80 for tons recycled and multiply tonnage by 0.20 for total project disposal.						
5. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)						
Asphalt: 0.61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)						
Concrete: 0.93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)						
Ferrous Metals: 0.22 (ex. 1000 CY Ferrous Metal = 220 tons)						
Non-Ferrous Metals: 0.10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)						
Drywall Scrap: 0.20						
Wood Scrap: 0.16						

END OF SECTION 01 74 19
Bulletin

**SECTION 01 77 00
CLOSEOUT PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. List of Incomplete Items.
 - 4. Warranties.
 - 5. Final cleaning.
 - 6. Repair of the Work.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for progress cleaning of Project site.
 - 2. Section 01 78 23 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 3. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Section 01 79 00 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.3 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.

- B. Contractor's List of Incomplete Items.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.5 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Certificate of Construction-Phase Commissioning Process Completion.
- D. Field Report: For pest control inspection.
- E. Site Waste Management Summary: Final summary of construction waste management data as specified in Section 01 74 19 "Construction Waste Management and Disposal."

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. Submittals Prior to Substantial Completion: Complete the following prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by District Construction Manager. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain District Construction Manager's signature for receipt of submittals.

CLOSEOUT PROCEDURES**01 77 00 - 2****KITCHEN MODIFICATIONS GROUP 6**

5. Submit testing, adjusting, and balancing records.
 6. Submit changeover information related to District's occupancy, use, operation, and maintenance.
- B. Procedures Prior to Substantial Completion: Complete the following prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise District that site is ready for final changeover of permanent locks. District will make final changeover.
 2. Complete startup and testing of systems and equipment.
 3. Complete commissioning requirements.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Advise District of changeover in utility services.
 6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 7. Complete final cleaning requirements.
 8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- C. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of seven days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect and Project Inspector will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.
- 1.8 FINAL COMPLETION PROCEDURES
- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list). Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - a. Certified:
 - 1) Signed and dated by person with authority to represent Contractor.
 - 2) Subsequent to 1) above, signed and dated by person with authority to represent Architect.

2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 3. Submit pest-control final inspection report.
 4. Instruct District's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of seven days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Project Inspector will either proceed with inspection or notify Contractor of unfulfilled requirements.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.9 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit List of Incomplete items in the following format:
 - a. PDF electronic file.

1.10 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with San Diego Air Pollution Control District allowable VOC levels.

PART 3 - EXECUTION**3.1 FINAL CLEANING**

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved, to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - g. Sweep concrete floors broom clean in unoccupied spaces.
 - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - j. Remove labels that are not permanent.
 - k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - p. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls." Section 01 74 19 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manual.
 - 2. Systems and equipment operation manuals.
 - 3. Systems and equipment maintenance manuals.
 - 4. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

- B. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.
- C. Delivery Media: Submit operation and maintenance manuals to District Construction Manager in the following media:
 - 1. Submit on digital media acceptable to District Construction Manager. Enable reviewer comments on draft submittals.
 - 2. Submit one paper copy.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, subject matter of

contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.6 COMMON REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of District.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for District Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."
- F. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- G. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 1. Do not use original project record documents as part of operation and maintenance manuals.

1.7 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by District's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

1.8 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of

a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by District's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.

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5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

1.9 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.

3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION (Not Used)****END OF SECTION 01 78 23**

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for final property survey.
 - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
 - 3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Submit one electronic copy of marked-up record prints.
- B. Record Specifications: Submit one electronic copy of marked-up record specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one electronic copy of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Construction Waste Management Plan: Submit one electronic copy of construction waste management plan and a final summary of construction waste management data as specified in Section 01 74 19 "Construction Waste Management and Disposal."

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued, depicting the current status of the Work.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 2. Content: Types of items requiring marking include:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order, Construction Change Directive, or Field Work Order.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 - o. Changes made by responses to Requests for Information (RFI's).
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, allowances applied, and similar identification, where applicable.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Note related Change Orders where applicable.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Note related Change Orders where applicable.

1.7 RECORDING AND MAINTENANCE

- A. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's, Project Inspector's, and District Construction Manager's reference during normal working hours.
- B. Review Record Documents weekly with Project Inspector. Indicate to Project Inspector the items incorporated in Project Record Documents concurrent with progress of the Work, including modifications, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION (Not Used)****END OF SECTION 01 78 39**

**SECTION 01 79 00
DEMONSTRATION AND TRAINING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing District's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.
- B. Related Requirements:
 - 1. Divisions 2 through 33 Sections for specific requirements for demonstration and training of products and systems in those Sections.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Architect.
 - d. Name of District Construction Manager.
 - e. Name of Contractor.
 - f. Names of Contractor Construction Manager, Project Manager, and Superintendent.
 - g. Date of video recording.
 - 2. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
 - 3. At completion of training, submit complete training manual(s) for District's use in PDF electronic file format.

1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to demonstration and training including:
 - 1. Inspect and discuss locations and other facilities required for instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 - 3. Review required content of instruction.
 - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

- A. Coordinate instruction schedule with District's operations. Adjust schedule as required to minimize disrupting District's operations and to ensure availability of District's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed by Architect.

1.7 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project record documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:

- a. Diagnosis instructions.
- b. Repair instructions.
- c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
- d. Instructions for identifying parts and components.
- e. Review of spare parts needed for operation and maintenance.

1.8 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.9 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and District for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct District's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. District will furnish a representative to describe District's operational philosophy.
 - 2. District will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide instruction addressing seasonal operations variations.
 - 1. Schedule training with District, through District Construction Manager, with at least seven days' advance notice.
- D. Training Location: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. When necessary, provide classroom training.
 - 1. Webinar training is not acceptable.
- E. Reference Material: Conduct training using final operation and maintenance data submittals.
- F. Cleanup: Collect used and leftover educational materials and give to District. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.10 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Digital Video Recordings: Provide high-resolution, color digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode.
 - 1. Submit video recordings on thumb drive.
 - 2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
 - 3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
 - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training thumb drive that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
 - a. Name of Contractor/Installer.
 - b. Business address.
 - c. Business phone number.
 - d. Point of contact.
 - e. E-mail address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
 - 1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
 - 1. Furnish additional portable lighting as required.

- E. Narration: Describe scenes on video recording by audio narration. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION (Not Used)****END OF SECTION 01 79 00**

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 buildings and site improvements.
- 2. Removing below-grade construction.
- 3. Disconnecting, capping or sealing, and removing site utilities.
- 4. Salvaging items for reuse by District.

B. Related Requirements:

- 1. Section 01 10 00 "Summary" for use of the premises, phasing requirements, interim housing considerations, coordination with occupants, etc.
- 2. Section 01 32 01 "Construction Progress Documentation".
- 3. Section 01 32 33 "Photographic Documentation" for preconstruction photographs taken before building demolition.
- 4. Section 01 74 19 "Construction Waste Management and Disposal".
- 5. Section 02 41 19 "Selective Demolition" for partial demolition of buildings, structures, and site improvements.
- 6. Section 02 82 33 "Removal and Disposal of Asbestos Containing Materials".
- 7. Section 02 83 33 "Removal and Disposal of Material Containing Lead".
- 8. Section 02 84 34 "Removal and Disposal of Universal Waste and PCB".
- 9. Section 31 10 00 "Site Clearing" for site clearing and removal of above- and below-grade site improvements not part of building demolition.
- 10. Section 31 20 00 "Earth Moving".

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 the District ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects, including cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to the District that may be uncovered during demolition remain the property of the District.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to the District.

1.5 PRE-INSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review structural load limitations of existing structures.
 - 3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review and finalize protection requirements.
 - 5. Review procedures for noise control and dust control.
 - 6. Review procedures for protection of adjacent buildings.
 - 7. Review items to be salvaged and returned to the District.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
 - 1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.
- D. Schedule of Building Demolition Activities: Indicate the following:
 - 1. Detailed sequence of demolition work, with starting and ending dates for each activity.
 - 2. Temporary interruption of utility services.
 - 3. Shutoff and capping or re-routing of utility services.
- E. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be

misconstrued as damage caused by demolition operations. Comply with Section 01 32 33 "Photographic Documentation." Submit before the Work begins.

- F. 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.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.8 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

1.9 FIELD CONDITIONS

- A. Building(s) to be demolished will be vacated and their use discontinued before start of the Work.
- B. Building(s) 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.
 - 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. 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 the District as far as practical.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify the District Construction Manager. Remove hazardous materials in accordance with Specification Sections 02 82 33, 02 83 33 and

02 84 34. The costs associated with such work shall be paid out of the appropriate Allowance, as approved by the District Construction Manager.

- E. Hazardous Materials: Present in buildings and structures to be demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
 - 3. Hazardous materials and locations are shown in the Drawings. The mitigation of this material is included in the Base Bid.
 - 4. If hazardous materials are encountered that are not shown in the Drawings, do not disturb: immediately notify the District Construction Manager. Remove hazardous materials in accordance with Specification Sections 02 82 33, 02 83 33 and 02 84 34. The costs associated with such work shall be paid out of the appropriate Allowance, as approved by the District Construction Manager.
- F. On-site storage or sale of removed items or materials is not permitted.

1.10 COORDINATION

- A. Arrange demolition schedule so as not to interfere with The District's on-site operations or operations of adjacent occupied buildings.

PART 2 - PRODUCTS

2.1 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 ANSI / ASSE A10.6 and NFPA 241.

2.2 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Section 31 20 00 "Earth Moving."

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. 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.
- C. 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 Section 01 32 33 "Photographic Documentation.

3.2 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: Comply with the following:
 - 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 the District.
 - 4. Transport items to storage area designated by the District.
 - 5. Protect items from damage during transport and storage.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.
 - 1. Arrange to shut off utilities with utility companies.
 - 2. 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.
 - 3. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
 - 4. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 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: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of demolition.
- C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.
 - 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by the District and authorities having jurisdiction.
 - 2. Provide temporary services during interruptions to existing utilities, as acceptable to the District and authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.
- D. Temporary Protection: 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."
 - 1. Protect adjacent buildings and facilities from damage due to demolition activities.
 - 2. Protect existing site improvements, appurtenances, and landscaping to remain.
 - 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
 - 4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 - 6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
 - 7. 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.

3.5 DEMOLITION, GENERAL

- A. General: Demolish indicated buildings and site improvements 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..
 - 2. Maintain active fire watch and portable fire-suppression devices during flame-cutting operations.
 - 3. Maintain active fire watch after flame-cutting operations per Contractor's approved Emergency Safety and Health (ES&H) Execution Plan.
 - 4. Maintain adequate ventilation when using cutting torches.
 - 5. 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: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from the District and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 - 2. 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.
- C. Explosives: Use of explosives is not permitted.

3.6 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each 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: Items to be removed and salvaged are indicated below:
 - 1. As indicated in drawings.
- D. Below-Grade Construction: Demolish foundation walls and other below-grade construction.

1. Remove below-grade construction, including basements, foundation walls, and footings, completely.
- E. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.
- F. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet outside footprint indicated for new construction. Abandon utilities outside this area.
 1. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Section 31 20 00 "Earth Moving."
- G. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.
- H. Hydraulic Elevator Systems: Demolish and remove elevator system, including cylinder, plunger, well assembly, steel well casing and liner, oil supply lines, and tanks.

3.7 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Section 31 20 00 "Earth Moving."
- C. 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.

3.8 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site 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 on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Do not burn demolished materials.

3.10 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.
 - 1. Clean roadways of debris caused by debris transport.

END OF SECTION 02 41 16

SECTION 02 41 19
SELECTIVE 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 selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.

- B. Related Requirements:

- 1. Section 01 10 00 "Summary" for use of the premises, phasing requirements, interim housing considerations, coordination with occupants, etc.
 - 2. Section 01 32 01 "Construction Progress Documentation".
 - 3. Section 01 32 33 "Photographic Documentation" for preconstruction photographs taken before building demolition.
 - 4. Section 01 50 00 "Temporary Facilities and Controls" for temporary construction and environmental protection measures for selective demolition operations.
 - 5. Section 01 74 19 "Construction Waste Management and Disposal".
 - 6. Section 01 73 00 "Execution" for cutting and patching procedures.
 - 7. Section 02 41 16 "Structure Demolition".
 - 8. Section 02 82 33 "Removal and Disposal of Asbestos Containing Materials".
 - 9. Section 02 83 33 "Removal and Disposal of Material Containing Lead".
 - 10. Section 02 84 34 "Removal and Disposal of Universal Waste and PCB".
 - 11. Section 31 10 00 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.

1.3 ALLOWANCES

- A. Allowances for repair of existing termite-damaged materials are specified in Section 01 21 00 "Allowances."

1.4 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.5 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects, including cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to the District that may be uncovered during demolition remain the property of the District.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to the District.

1.6 PRE-INSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.

- C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
- D. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure District on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Coordination of District continuing occupancy of portions of existing building and of District partial occupancy of completed Work.
 - 6. Locations of proposed dust and noise control temporary partitions and means of egress.
 - 7. Means of protection for items to remain and items in path of waste removal from building.
- E. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces that might be misconstrued as damage caused by demolition operations. Comply with Section 01 32 33 "Photographic Documentation." Submit before Work begins.
- F. 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.
- G. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.8 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.9 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.10 FIELD CONDITIONS

- A. The District will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so the District operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by the District as far as practical.
- C. Notify the District Construction Manager of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify the District Construction Manager. Remove hazardous materials in accordance with Specification Sections 02 82 33, 02 83 33 and 02 84 34 The costs associated with such work shall be paid out of the appropriate Allowance, as approved by the District Construction Manager.
- E. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
 - 3. Hazardous materials and locations are shown in the Drawings. The mitigation of this material is included in the Base Bid.
 - 4. If hazardous materials are encountered that are not shown in the Drawings, do not disturb; immediately notify the District Construction Manager. Remove hazardous materials in accordance with Specification Sections 02 82 33, 02 83 33 and 02 84 34 The costs associated with such work shall be paid out of the appropriate Allowance, as approved by the District Construction Manager.
- F. Termite Infestation: It is not expected that active termite infestations will be encountered in the Work.
 - 1. If active termite infestations are encountered, do not disturb; immediately notify the District Construction Manager who will have the infestations investigated. Allow three days when no work will be permitted on those portions of the Work suspected of having active termite infestations.
- G. Storage or sale of removed items or materials on-site is not permitted.

- H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

- 1. Maintain fire-protection facilities in service during selective demolition operations.

1.11 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.12 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with the District operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI / ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by the District. The District does not guarantee that existing conditions are same as those indicated in Project Record Documents.

- C. 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 selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- D. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs or video.
 - 1. Comply with requirements specified in Section 01 32 33 "Photographic Documentation."
 - 2. 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.
- E. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to District Construction Manager.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.

- c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to the District.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.
 - h. Fire-Suppression Systems: Provide temporary fire protection per Contractor's approved Emergency Safety and Health (ES&H) Execution Plan.
4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
- a. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations.
 5. Maintain active fire watch and portable fire-suppression devices during flame-cutting operations.
 6. Maintain active fire watch after flame-cutting operations per Contractor's approved Emergency Safety and Health (ES&H) Execution Plan.
 7. Maintain adequate ventilation when using cutting torches.
 8. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 9. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 10. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 11. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to the District.
 4. Transport items to the District storage area designated by District.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by District Construction Manager, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
 1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI (Resilient Floor Covering Institute).
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section for new roofing requirements.
 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 2. Remove existing roofing system down to substrate.
- G. Air-Conditioning Equipment: Remove equipment without releasing refrigerants. Cap all ducts to remain, if new equipment is not immediately installed.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.9 SELECTIVE DEMOLITION SCHEDULE

- A. Remove: As indicated in drawings.
- B. Remove and Salvage: As indicated in drawings.
- C. Remove and Reinstall: As indicated in drawings.
- D. Existing to Remain: As indicated in drawings.
- E. Dismantle: As indicated in drawings.

END OF SECTION 02 41 19

SECTION 02 82 33**REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS****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.
- B. Hazardous Building Materials Survey Reports, prepared by the District's Consultant, are available from the District Construction Manager.

1.2 REFERENCE DOCUMENTS

- A. The current issue of the following documents are incorporated herein and shall govern the conduct of the Work. Where conflict among requirements or with this specification exists, the more stringent requirements shall apply.
- B. Code of Federal Regulations (CFR):
 - 1. 29 CFR 1910, Occupational Safety and Health Standards, General.
 - 2. 29 CFR 1910.134 Respiratory Protection.
 - 3. 29 CFR 1910.1001 Asbestos – General Industry.
 - 4. 29 CFR 1910.1200, Hazard Communication.
 - 5. 29 CFR 1926 Occupational Safety and Health Standards, Construction.
 - 6. 29 CFR 1926.55, Gases, Vapors, Fumes, Dusts, and Mists.
 - 7. 29 CFR 1926.59, Hazard Communication.
 - 8. 29 CFR 1926.1101 Asbestos – Construction Industry.
 - 9. 40 CFR 61 Subpart A and Subpart M, USEPA, National Emission Standards for Hazardous Air Pollutants (NESHAP).
 - 10. 40 CFR, Part 763, The Asbestos Hazard Emergency Response Act.
 - 11. 49 CFR Parts 106, 107, 171 to 179, The Transportation Safety Act, Hazardous Material Transportation Act.
- C. California Code of Regulations (CCR):
 - 1. Title 8, Section 1514, Personal Protective Equipment
 - 2. Title 8, Section 1529 Asbestos in the Construction Industry.
 - 3. Title 8, Section 1531 Construction Respiratory Protective Equipment.
 - 4. Title 8, Section 3203 Injury and Illness Prevention Program.
 - 5. Title 8, Section 5144 Respiratory Protective Equipment.
 - 6. Title 8, Section 5155 Airborne Contaminants.
 - 7. Title 8, Section 5194 Hazard Communication.
 - 8. Title 8, Section 5208 General Industry Safety Orders, Asbestos Regulations.

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- D. State and Local Regulations: Those regulations promulgated under the Clean Air Act or Occupational Safety and Health Act and incorporated in a State plan recognized by EPA or OSHA, respectively.
 - 1. San Diego Air Pollution Control District Subpart M, National Emission Standards for Asbestos, Rule 361.145 Standard for Demolition or Renovation.
 - 2. San Diego Air Pollution Control District – Regulation XII, Rule 1206: Asbestos Removal, Renovation, and Demolition (Adopted and Effective 11/15/17).
- E. American National Standards Institute (ANSI):
 - 1. ANSI Standard Z9.2 Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems.
- F. American Society for Testing and Materials (ASTM):
 - 1. ASTM Standard D1331 Standard Test Methods for Surface and Interfacial Tension of Solutions of Surface Active Agents.
 - 2. ASTM Standard E1368 Standard Practice for Visual Inspection of Asbestos Abatement Projects.
 - 3. ASTM Standard E1494 Standard Practice for Encapsulation Testing of Friable Asbestos-Containing Surfacing Materials.

1.3 SUMMARY

- A. Section includes the furnishing of all labor, materials, facilities, equipment, services, employee training, permits, agreements, waste transport and disposal necessary to perform the work required for asbestos removal in accordance with these specifications, EPA, APCD, OSHA, NIOSH, State of California regulations, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.
- B. Perform the work and provide service as needed to accomplish abatement of asbestos containing materials at the Project Site. Specific locations and materials to be removed/disturbed are indicated on the Drawings. Sampling data for identification of asbestos containing materials and non-asbestos containing materials is available from the District Construction Manager. The requirements of all regulations and specifications must be observed for the removal or disturbance of any material containing any amount of "asbestos." Confirm ACM and ACCM locations and quantities prior to initiating renovation activities
- C. Comply with the requirements of all regulations and specifications for the removal or disturbance of any material containing any amount of "asbestos," including materials containing <1% asbestos.

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

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- D. Comply with all requirements of this specification. Alternate and innovative technologies and procedures are encouraged and must be submitted in detail for approval prior to any work being performed. Any alternative technologies submitted must have been written by a Certified Industrial Hygienist (CIH) or State of California Certified Asbestos Consultant (CAC).
- E. In the event ACMs or ACCMs in addition to those indicated in the Drawings are discovered, do not disturb. Immediately notify the District Construction Manager who will have the additional materials tested.
- F. Related Requirements:
 - 1. Section 02 83 33 "Removal and Disposal of Materials Containing Lead" for lead abatement.
 - 2. Section 02 84 34 "Removal and Disposal of Universal Waste and PCB" for Universal Waste and PCB abatement.

1.4 ALLOWANCES

- A. Allowances for removal and disposal of ACM and ACCM in addition to those indicated on the Drawings are specified in Section 01 21 00 "Allowances."

1.5 DEFINITIONS

- A. All terms not defined herein shall have the meaning given in the applicable publications and regulations.
- B. "Abatement Activities" shall mean all activities from the initiation of work area preparation through successful clearance air monitoring performed at the conclusion of an asbestos project.
- C. "Air Lock" shall mean an enclosed space designed to control air movement between two areas. It is composed of sealed spaces with curtained doorways at its portals. A Worker Decontamination Facility contains at least three air locks.
- D. "Ambient Air Monitoring" shall mean measurement or determination of airborne asbestos fiber concentrations outside but in the general vicinity of the work site.
- E. "Amended Water" or "Wetting Agent" shall mean water to which an approved surfactant has been added in proportion of at least one (1) ounce surfactant to five (5) gallons water.
- F. "Asbestos-Containing Materials (ACM)" shall mean any insulation, fireproofing, plaster, ceiling or floor tiles and any other building materials containing more than 1% asbestos (>1%).

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

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- G. "Asbestos-Containing Construction Material (ACCM)", also referred to as "trace" asbestos materials, shall mean any material containing between one-tenth of one percent and one percent asbestos (0.1% - 1%).
- H. "Asbestos-Contaminated Objects" shall mean any objects, which may be contaminated by asbestos or asbestos-containing material as determined by the Consultant.
- I. "Asbestos Disposal" shall mean the removal of containerized asbestos, asbestos-containing material, asbestos-containing waste material and asbestos-contaminated objects from the regulated area to the final EPA approved disposal site.
- J. "Authorized Visitors" shall mean any visitor authorized by the Consultant or any representative of a regulatory agency or other agency having jurisdiction over the project.
- K. "Barriers or Containment Barriers" shall mean walls, tunnels, or enclosures erected to separate any section of an abatement area from adjoining spaces. Where indicated on drawings, barriers shall be constructed of 2'x 4's, with minimum 1/2" plywood walls, and all seams in plywood and edges shall be sealed airtight with caulking. The inside (work) side of all such barriers shall be covered with two (2) layers of 6-mil polyethylene sheeting. Tunnels to maintain public access through a work area shall also be defined as part of the barriers. All lumber, plywood, and polyethylene shall be flame retardant and shall bear manufacturer's label.
- L. "Baseline or Background Air Monitoring" shall mean a measurement or determination of airborne asbestos fiber concentrations inside the workplace and outside a building prior to starting abatement activities.
- M. "Certified Clean" shall mean that a work area has no visible signs of fibrous materials or other contamination and does not have levels of airborne fiber above the defined air clearance criteria.
- N. "Class I asbestos work" means activities involving the removal of thermal systems insulation (TSI) and surfacing ACM and PACM.
- O. "Class II asbestos work" means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
- P. "Class III asbestos work" means repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed.
- Q. "Class IV asbestos work" means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS**02 82 33 - 4****KITCHEN MODIFICATIONS GROUP 6**

- R. "Clean or Decontaminate" shall mean to make a surface free of all visible and optically detectable fibers by thoroughly HEPA-vacuuming and wet washing with sponges and mops.
- S. "Clean room" shall mean an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.
- T. "Competent Person" shall mean one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them, In addition, for Class I and Class II work, one who is specially trained in a training course that meets the criteria of EPA's Model Accreditation Plan (40 CFR part 763) for supervisor, or its equivalent.
- U. "Consultant" shall mean the consulting industrial hygienist. The Consultant is an independent party retained by the District to provide consultation services for asbestos abatement activities.
- V. "Curtained Doorway or Entrance" shall mean a portal which limits air movement between two areas, constructed by placing two overlapping sheets of plastic over an existing or temporary doorway, by securing each along the top of the doorway, by securing the vertical edge of one sheet along one vertical side of the doorway, and by securing the vertical edge of the other sheet along the opposite vertical side of the doorway.
- W. "Decontamination Facility (DF) or Area (DA)" shall mean a series of connected rooms or spaces including clean room, shower room, and contaminated dirty (equipment) room, each separated by an air lock; and used for the decontamination of all workers, and their personal protective equipment leaving an asbestos removal work area, as well as for access to such work areas. All decontamination facilities shall be a "structural" (i.e. capable of supporting workers standing above).
- X. "Disposal Site" shall be an EPA approved landfill.
- Y. "District" shall mean the San Diego Unified School District.
- Z. "Disturb" shall mean contact that releases fibers from ACM, PACM, or ACCM. It includes any activity that disrupts the matrix of ACM, ACCM, or PACM, crumbles or pulverizes ACM, ACCM, or PACM, or generate visible debris from ACM, ACCM or PACM. Any activity which alters, changes, or stirs ACM or PACM, including encapsulation, enclosure or repair of ACM or asbestos contaminated material.
- AA. "Encapsulation" shall mean procedures necessary to coat or saturate material with an approved encapsulant liquid to control the possible release of fibers into the ambient air. "Encapsulant" (sealant) shall mean liquid material which can be applied to other solid material which reduces the possible release of fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS**02 82 33 - 5****KITCHEN MODIFICATIONS GROUP 6**

- BB. "Equipment room" means a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.
- CC. "Fiber" shall mean a particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.
- DD. "Final Cleaning" shall mean that no three-dimensional material is visible to the naked eye.
- EE. "Fixed Items" shall mean equipment, furniture, radiators, or other objects, which cannot be removed from the work area, plus walls and floors.
- FF. "HEPA-Filtered Exhaust Units or Fans" shall mean a fan equipped with a High Efficiency Particulate Air:(HEPA)filter greater than 99.97 percent efficient by 0.3 micron DOP test, and complying with ANSI Z9.2, Local Exhaust Ventilation. It shall be used to create a pressure in a work area (reduced with respect to surrounding areas) in order to prevent the escape of asbestos fibers. It shall also be used to reduce and control the airborne concentration of asbestos fibers.
- GG. "HEPA-Filtered Vacuum" shall be a vacuum cleaner specifically designed for and equipped with HEPA-filtration.
- HH. "Install" shall mean set in place completely ready for normal use or service, including all necessary mounting facilities, connections and testing.
- II. "Isolation Barriers" shall mean the construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off the workplace from surrounding areas and to contain asbestos fibers in the work area.
- JJ. "Lockout" shall mean the safe, approved means for shutting down HVAC equipment, electrical panels or breakers and water so that they cannot be inadvertently turned back on.
- KK. "Log" shall mean an official record of all activities that occurred during the project and it shall identify the District, Contractor, workers, floor number, date, work area, and other relevant information to the project.
- LL. "Major Abatement" shall mean the removal of ACM under contained conditions utilizing full isolation and negative pressure ventilation systems.
- MM. "Minor Abatement" shall mean the removal of ACM utilizing "glovebag" methods or modified containment.
- NN. "Outside Air" shall mean the air outside the buildings and structures.
- OO. "Outside/Ambient Air Samples" shall mean samples collected outside of the containment area in the building and analyzed using the NIOSH 7400 Method.

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS**02 82 33 - 6****KITCHEN MODIFICATIONS GROUP 6**

- PP. Presumed Asbestos-Containing Material (PACM) means thermal systems insulation or surfacing material found in buildings constructed no later than 1980, unless rebutted according to 8 CCR 1529 (k)(4).
- QQ. "Project" or "Project Site" shall refer to Clairmont High School and Bell Middle School,
- RR. "Protect Fixed Items" shall mean to cover with solid enclosures and 6-mil polyethylene sheeting, and secure by taping or gluing water and airtight.
- SS. "Provide" shall mean furnish (or supply) and install.
- TT. "Regulated Area" shall have the meaning set forth in 8 CCR 1529, which is an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit.
- UU. "Remove Asbestos" shall mean to make a surface free of all visible fibrous materials or microscopically detectable asbestos fibers.
- VV. "Renovation" shall mean an addition or alteration or a change or modification of building or the service equipment therefore which is not classified and an ordinary repair.
- WW. "Repair" shall mean corrective action using specified work practices (e.g. glove bag, plastic tent procedures, etc) to minimize the likelihood of fiber release from minimally damaged area of ACM.
- XX. "Replacement Material" shall mean any material approved by the District used to replace ACM.
- YY. "Seal" or "Block and Seal" shall mean preparing a space or area such that there is no air movement or passage to and from the area. "Isolation barrier" shall mean the system of seals or other items, which prevent air movement to and from any work area.
- ZZ. "Shift" shall mean a worker's or simultaneous group of workers' complete daily term of work.
- AAA. "Surface Barriers Protective Coverings or Poly" shall mean the plasticizing of walls, floors, and fixed objects within the work area to prevent contamination during subsequent abatement activities.
- BBB. "Surfactant" shall mean a chemical wetting agent added to water to improve penetration into asbestos-containing materials and thereby reduce the generation of airborne asbestos fibers.
- CCC. "Work Area" shall mean an area where asbestos removal or other abatement procedures are being performed. A work area is considered a contaminated space

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between the times preparation begins and the time the area is certified clean by the Consultant.

DDD. "Work Place" shall mean the work area and the project site.

1.6 PRE-ABATEMENT MEETINGS

A. Pre-Abatement Conference: Conduct conference at Project Site.

1. The District will arrange a Pre-Abatement Conference, attended by a representative of the District, the Consultant, the General Contractor, and the Abatement Contractor.
2. The Contractor shall identify his Supervisor and Foreman at this conference.
3. Provide electronic copies of "Action Submittals" at least five working days prior to this conference.
4. Pre-Abatement Conference topics include:
 - a. Contractor listing of existing site condition (e.g. damage).
 - b. Contractor and supporting vendor site access and parking.
 - c. Coordination of Contractor access routes to the work area, including approved doors, stairways, corridors, and elevators.
 - d. Availability of building utility services, such as power, water, and drains.
 - e. Determination of equipment and other movable items to be removed from the work area(s) by the Contractor, and the location of temporary storage space.
 - f. Location, coverage, and use of isolation barriers and decontamination facilities.
 - g. Emergency Response Procedures.
 - h. Visual identification and quantification of ACM and ACCM.

1.7 ACTION SUBMITTALS

A. Asbestos Abatement Plan prepared and signed by a Competent Person. The Plan shall be site specific, and shall include minimally the following:

1. The proposed removal methods for each type of ACM or ACCM including a detailed listing of all materials, tools, equipment, and expendable supplies that will be used during the project. For each listed item provide (as appropriate) the manufacturer's name, catalog number or model, a description of its function and location of use, an actual sample or photocopy of manufacturer's brochure. The listing shall include at a minimum spray encapsulants, wetting agents, spray adhesives (including Material Safety Data Sheets (MSDS), and equipment including HEPA-vacuums, HEPA-filtered exhaust fans, respirators, protective clothing, waste containers, protective fireproof plastic coverings, sealing tapes, materials and compounds, temporary power and electric equipment, shower water pumps and filters, encapsulating equipment, and materials for constructing decontamination facilities and barriers.

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2. A sketch or written description detailing the regulated work area, decontamination set-up, waste-load out, location and number of negative machines.
3. A description of the exhaust system including proposed number, capacity, and location of HEPA exhaust units, and the method of discharge to the building exterior.
4. A work sequencing plan that includes the number of shifts, shift times, and number of workers per shift for each phase of remediation work. Include name, summary of experience, and certifications for asbestos work of all personnel, including supervisors who may be used during the contract period (minimum of one qualified supervisor is required).
5. A waste disposal plan including the labeling of waste containers, proposed waste hauler, and proposed landfill(s) for friable and non-friable asbestos waste.
6. A security plan including the locations of warning signs, prevention of unauthorized entry into the area, log book forms for recording entries into the work areas, accident prevention, equipment, and methods to communicate between personnel inside and outside the work areas.
7. An emergency/contingency plan including emergency ingress/egress from the work areas, accident notification policy, emergency fire and accident response procedures (including emergency decontamination procedures).

1.8 INFORMATIONAL SUBMITTALS

A. Pre-Abatement Submittals:

1. Copies of notifications to government entities, including San Diego Air Pollution Control District and California-OSHA (Division of Occupational Safety and Health). Notifications by Contractor are limited to only those parties Contractor is required to notify by law and this specification. Notification to the Project Inspector and Consultant are also required at least 5 days prior to commencement of each phase or mobilization of asbestos work.
2. Signed documentation of training and education of all proposed workers, including respirator fit tests and copies of OSHA specified medical exams with respirator approvals. If documents expire prior to final project completion, provide updated documents.
3. List of all Sub-Contractors proposed for this project, with their specialty and qualifications along with submittals meeting the same requirements.
4. Proposed waste hauler and copies of applicable licenses, including solid waste transportation registration issued by the California Department of Health Services Toxic Substance Division.
5. Proposed landfill for disposal of waste materials and letter from landfill authorizing hauler to dispose there.
6. A copy of the Contractor's State of California, Department of Industrial Relations, Division of Occupational Safety and Health, Certificate of Registration for Asbestos-Related Work.

B. Submittals During Abatement Work:

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1. Regulated area entry logs showing names of person entering the workspace, date and time of entry and exit.
2. Safety log, including record of any accident, emergency evacuation, and any other safety and health incident.
3. Submit on a daily basis to the Consultant:
 - a. Personal air monitoring results as conducted by the Contractor.
 - b. For OSHA Class I asbestos work, recording/printouts of negative pressure manometer readings inside containment.

C. Submittals After Abatement Work:

1. Original manifests and receipts acknowledging disposal of all hazardous and non-hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.
 - a. Submit within 30 days of date that material was transported off site.

1.9 CLOSEOUT SUBMITTALS

A. Submit immediately upon completion of abatement work:

1. Original manifests and receipts acknowledging disposal of all hazardous and non-hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.
 - a. Submit within 30 days of date that material was transported off site.
2. A copy of the entry-exit logbook.
3. All personal monitoring results.

1.10 PERFORMANCE REQUIREMENTS

A. Authority to Stop Work:

1. The District retains the authority to stop abatement work at any time the District and Consultant determines that conditions are not within the specifications and applicable regulations. The stoppage of work shall continue until conditions have been corrected and corrective steps have been taken to the satisfaction of the Consultant and/or District.
2. Stop Work Orders may be issued for, but are not limited to, the following:
 - a. Poor work practices related to fiber control, including failure to adequately wet and failure to keep regulated area clean and free from debris.
 - b. Excessive airborne fibers inside or outside the work area.
 - c. Breaks in barriers.
 - d. Loss of negative air pressure (i.e. a manometer reading of less than 0.02 inches of water) for any OSHA Class I Work.

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- e. Any other situation (outside the work area) where the District and/or Consultant establishes that the airborne clearance criterion is reached (i.e. fiber concentration at or greater than 0.01 fibers/cc outside containment). When the clearance criterion of 0.01 fibers/cc is reached for non-work areas, stop work and initiate cleanup procedures to reduce airborne fiber levels to below 0.01 f/cc for non-work areas.

B. Project Supervision:

- 1. Provide English-speaking on-site Supervisor and at least one Foreman for each work area at all times while abatement work is in progress. The Supervisor and Foreman shall be Competent Persons, as defined by 8 CCR 1529, and must be experienced in asbestos abatement work, knowledgeable of all EPA, OSHA, and local regulations, and capable of skillfully executing all work promptly, efficiently, and in compliance with all requirements of this Specification.
- 2. Upon request of the District and/or Consultant, submit proof of qualifications and project experience for the Supervisor and Foreman.
- 3. The District reserves the right to have any supervisory personnel removed if they do not demonstrate the requisite experience or skills to safely direct the work, and adequately protect their own employees or District.
- 4. Instruct, train, and provide required protective devices for all workers of other trades who must enter any work area before it is certified clean. The instruction shall include, at a minimum, proper use and fitting of respiratory protective devices and protective clothing, entry and exit procedures for all work areas, hazards, or asbestos exposure, work procedures, and other safety requirements contained in this Specification.
 - a. Proof of such instructions for other trades shall be supplied prior to being allowed to enter the work area.
 - b. The instruction does not relieve the other trades from the regulatory requirements for medical surveillance and other requirements of 8 CCR 5144 for the use of respiratory protective devices. Copies of the medical surveillance examinations shall also be provided prior to being allowed to enter the work area.

C. Availability of Trained Personnel:

- 1. Since other construction-related activities cannot commence until the successful decontamination of the work area, it is imperative that a sufficient number of trained personnel be provided for the duration of abatement activities to complete the work within the required schedule.
- 2. Do not staff the project with untrained, unqualified, or any unapproved personnel to speed up the completion of the abatement work.

D. Protection of Persons and Property:

- 1. General Safety Requirements:

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- a. Initiate, maintain, and supervise all safety precautions and programs in connection with the Work. Take all reasonable precautions for the safety of, and provide reasonable protection to prevent damage, injury, or loss to:
 - 1) All employees on the Work and other persons who may be affected thereby.
 - 2) All Work and all materials and equipment to be incorporated therein.
 - 3) Other property at the Project Site and adjacent thereto.
 - b. Give all notices and comply with all applicable laws, ordinances, rules, regulations, and orders of any public authority bearing on the safety of persons and property and their protection from damage, injury, and loss.
 - c. Remedy all damage or loss of any property caused in whole or in part by the Contractor, any Sub-Contractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The Contractor shall be responsible for the protection of any finished work from damage or defacement by his/her operation.
2. Assess and control the real or potential impacts of the Work upon the District's Life Safety Systems (e.g. smoke detectors, sprinkler systems, etc.). Establish coordination prior to any commencement of work, subject to modification by the District at any time, based on the District's assessment of risks to the function of the life safety systems associated with the Contractor's actions.
 3. Establish an effective safety program in accordance with the requirements set forth in 8 CCR Subchapter 4, Construction Safety Orders and 29 CFR 1926 Safety and Health Regulations for Construction, Subpart A through Z.
- E. Respiratory Protection:
1. Provide all workers, foremen, superintendents, authorized visitors, and inspectors who have been medically cleared for respirator use and fit tested for the respirator type being used, personally issued and marked respiratory protective equipment approved by NIOSH. When respirators with disposable filters are employed provide sufficient filters for replacement as necessary by the worker or authorized visitor. Filters shall be disposed of as contaminated waste.
 2. Instruct and train each worker involved in asbestos abatement (Class I, II, III) or maintenance and repair of asbestos-containing materials in proper respiratory use and require that each worker always wear a respirator properly fitted on the face in the work area from the start of any operation that may cause airborne asbestos fibers until the work area is completely decontaminated and cleared for re-occupancy. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.
 3. A respirator providing a minimum protection factor of 10 and equipped with a HEPA/P100 filter shall be used as long as 0.5 f/cc is not exceeded within the work area. If exceeded, all work inside the work area shall stop, and corrective actions (cleaning and better use of engineering controls) will be required until

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- fiber levels are reduced to less than 0.5 f/cc. Filtering facepiece device respirators are not permitted.
4. Unless otherwise permitted, respiratory protection as specified herein shall be worn at all times, within the regulated work area.
 5. Facial hair such as beards, long sideburns, and moustaches that interfere with the seal of air purifying type respirators are prohibited. Workers with eye corrective lenses (contact lenses or glasses) shall wear the corrective lenses in a manner that is in compliance with 8 CCR 1529 and 8 CCR 5144.
 6. Respiratory protection use, inspection, maintenance, decontamination, and storage procedures shall meet the requirements of 8 CCR 5144. In addition:
 - a. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures as stated herein.
 - b. Airline respirators with HEPA-filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filter/power pack assemblies shall be decontaminated in accordance with manufacturers' recommendations.
 - c. Whenever respirator design permits, workers shall perform a positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow (using the methods specified by the manufacturer) every four (4) hours of use and each time the worker enters or exits the work area. Maintain written logs of these tests.
 - d. Furnish to the Consultant written documentation that each worker is medically approved to wear respirators and has been properly trained in their use, inspection, care, maintenance, and fit testing pursuant to the Contractor's written Respirator Plan.
 7. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, the more stringent requirements must be met.
 - a. OSHA U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards 29 CFR 1910, Section 1001 and Section 1910.134, 29 CFR 1926.
 - b. NIOSH National Institute for Occupational Safety and Health.
 - c. California Code of Regulations 8 CCR 5144.

F. Personal Protective Equipment:

1. Provide to all workers, foremen, superintendents and authorized visitors and inspectors that may enter the asbestos regulated work area protective disposable clothing consisting of full-body coveralls, head covers, gloves, 18-inch high boot-type covers or reusable footwear, and eye protection.

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2. Provide hard hats and safety shoes as required by job conditions and safety regulations.
3. Reusable footwear, hardhats, and eye protection devices shall be left in the "Contaminated Equipment Room" until the end of the asbestos abatement work, at which time they shall be disposed of as ACM waste or transferred to another work area by methods approved by the Consultant.
4. All disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the workspace to the outside through the decontamination facilities.

G. Decontamination Facilities:

1. Worker decontamination enclosure systems shall be provided at all locations where workers will enter or exit the work area. At a minimum, one system at a single location is required.
2. Worker decontamination enclosure systems constructed at the project site shall utilize 6-mil black or opaque polyethylene sheeting or other approved materials for privacy.
3. The personal decontamination unit shall not be located inside the work area without written authorization from the District and/or Consultant.
4. Alternate methods of providing Decontamination facilities may be submitted to the District and/or Consultant for approval. Implementation of these alternative methods may not proceed without written approval by the District and/or Consultant.
5. For OSHA Class I (Friable) work, the worker decontamination enclosure system shall consist of at least a clean room, a shower room, and an equipment room, each separated from the other and from the work area by airlocks.
6. For OSHA Class II (Non-friable) work or a work area for the removal of an ACCM, the worker decontamination enclosure system shall consist of at least a clean room and an equipment room, each separated from each other and the work area by airlocks.
7. The clean room shall be sized for the work crew. Space for storing respirators shall be provided in this area. Clean work clothes, clean disposable clothing, replacement filters for respirators, towels and other necessary items shall be provided in adequate supply in the clean room. A location for posting notices shall also be provided in this area.
8. The shower room shall contain one or more showers to adequately accommodate workers. Each showerhead shall be supplied with warm and cold water, and be protected against leakage of any kind. An adequate supply of soap, shampoo and towels shall be supplied by the Contractor and be available at all times. Shower water shall be drained, collected, and filtered through a system with at least a 0.5 to 1.0 micron particle size collection capacity.
9. The equipment room shall be used for the storage of equipment and tools at the end of a shift after the tools have been decontaminated using HEPA-filtered vacuum and/or wet cleaning techniques, as appropriate. Replacement filters, stored in sealed containers until used, for filtration equipment, extra tools, containers, surfactants and other materials and equipment that may be required during abatement activities may also be stored in the equipment room. A walk-off pan (e.g. a small children's swimming pool or equivalent), filled with water, shall

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be located in the room for workers to clean off foot coverings after leaving the work area and prevent excessive contamination of the worker decontamination enclosure system. A drum lined with a labeled 6-mil polyethylene bag for collection for disposable clothing shall be located in the equipment room. Contaminated footwear shall be stored in this area for reuse the following workday.

H. Worker Protection Procedures:

1. Provide all personnel throughout the abatement process with the specified protective clothing and respiratory protection. Ensure that all personnel entering and leaving the workspace follow the following procedures:
 - a. Entering from the outside: Change from street clothes into the protective clothing and wear clean protective gear, go through Shower Room into Dirty Equipment Room, pick up equipment and tools, and enter the Work Area.
 - b. Exiting from the Work Area: Dispose of all protective clothing into plastic bags labeled for asbestos waste. Do not take off the respirator, but still wearing the respirator, enter the shower, and shower thoroughly. Remove respirator and wash and wipe thoroughly to decontaminate the respirator. After drying, enter the Clean Room, store the decontaminated respirator in the assigned space, and dress into street clothes.
2. Post written procedures in workplace and train all personnel on the procedures for the evacuation of the injured and the handling of potential fires. Provide air to a seriously injured worker without delay for decontamination. Make provisions to minimize exposure of rescue workers and to minimize spreading of contamination during evacuations and fire procedures.
3. Instruct all employees and workers in the proper care of their personally issued respiratory equipment, including daily maintenance, sanitizing procedures, etc.
4. Contractor's project supervisory personnel shall inspect all respiratory equipment at the beginning of each work period, including breaks and lunch periods. Written records of these inspections shall be maintained and provided to the Consultant.

I. Exposure Controls and HEPA-Filtered Exhaust Ventilation:

1. Install inside the work area one or more portable HEPA-filtered exhaust units to maintain the area, including the Decontamination Facilities, under negative air pressure, and to reduce or control airborne asbestos fiber concentrations. Provide a contingency plan for maintaining negative air requirements in the event of mechanical failure.
2. To determine the number of required units, compute the total cubic footage of all workspaces within the work and determine the air moving capacity of all the HEPA-filtered units to be used in each workspace. This measurement shall be made in cubic ft/min. under a filter load equivalent to two inches of static pressure.

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- a. The exhaust(s) must be capable of providing: 1) at least four (4) full air changes per hour in the work area and for "Class I Work"; 2) an inward velocity through any openings, including the decontamination facilities, of at least 200 fpm; and 3) a static negative air pressure inside the area of a minimum of 0.02 inches water column. Each exhaust system shall have a dedicated power system and shall be operated continuously (24 hours/day) in accordance with "Specifications and Operating Procedures for the Use of Negative Pressure Systems for Asbestos Abatement," Guidance for Controlling Asbestos-Containing Materials in Building, EPA report Number 560/5-85-024 (1985).
- b. Each exhaust unit shall be equipped with the following:
 - 1) Magnehelic gauge to monitor the unit's air pressure difference across the filters and to interpret the magnehelic reading to CFM.
 - 2) Automatic shut off for filter failure or filters absence.
 - 3) Audible alarm with flashing red light for unit shutdown.
 - 4) Amber Flashing warning light for excessive filters loading.
 - 5) A safety system that prevents unit from being operated with the HEPA filter in backwards.
- c. All-exhaust air shall pass-through HEPA filters before being discharged to the exterior of a building. The exterior exhaust discharge point shall be at least 10 feet from a receptor such as an air intake port, or louvers.
- d. Before starting any work, submit in writing the proposed number, capacity, and location of exhausts, and the method of discharge to the building exterior. Work shall not be permitted until the Consultant approves the proposed exhaust system.
- e. Exhaust systems shall be operated twenty four (24) hours per day at all times during preparation, removal, encapsulation, and cleanup tasks as specified herein; and until final "clean air" certification is obtained for the area, and Consultant directs Contractor to shut the system down.
- f. On loss of negative air pressure or electric power, all work activities in the area shall stop immediately and shall not resume until power is restored and the HEPA-exhaust systems are operating again. When power failure or loss of negative pressure lasts, or is expected to last, longer than one hour, the following shall occur:
 - 1) The make-up air inlets in the decontamination facilities and any other make-up air inlets shall be sealed airtight;
 - 2) The decontamination facilities shall be sealed airtight after the evacuation of all personnel from the work area;
 - 3) All adjacent areas shall be monitored for asbestos fiber concentration upon discovery of, and subsequently throughout the power failure.
- g. Provide and continuously operate for all "Class I Work" an automatic air pressure differential recording instrument that produces a permanent record. Recorder shall have a range of -0.09" H2O to +0.09" H2O. Copies of the recorded reading shall be maintained and provided daily to the Consultant.

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- h. This system must conform to the previously described requirements and 29 CFR 1926.58 Appendix F "Exhaust Air Filtration System."
- J. Air Monitoring:
 - 1. Consultant Air Monitoring:
 - a. Provide full cooperation and support to the Consultant throughout the course of the monitoring work. The Consultant will closely and continuously monitor the performance and execution of the work. The monitoring work will be performed inside the surrounding area to ensure full compliance with these specifications and all applicable regulations. Ambient air samples will be collected and analyzed by the Consultant. Consultant monitoring and inspections will include air samples at the entrance to the containment, air samples in the areas surrounding the work areas, at the negative-air handling unit exhaust, and outside the work area, checking of the Contractor's standard operating procedures, engineering controls, respiratory protection equipment, packing, packaging, transporting and disposal of asbestos, decontamination facilities and procedures, and any other aspects of the abatement process that may impact the health and safety of the people and the pollution of the environment.
 - b. The District will bear all costs in connection with the laboratory work required in Paragraph above. However, the costs of all subsequent laboratory analysis taken because the limits specified were exceeded on the initial tests shall be borne by the Contractor. The Contractor shall also conduct and bear the cost of personal air samples for OSHA compliance.
 - c. The Contractor may request copies of all laboratory reports presenting the results of the Consultant's air monitoring and inspection.
 - 2. Contractor Air Monitoring:
 - a. The Contractor shall be responsible for personal air monitoring to document compliance of their workers with OSHA regulations using the methods as reiterated below.
 - b. The analysis laboratory performing this work shall be an independent party not financially or managerially connected to the contractor.
 - c. The laboratory shall be successfully participating in the American Industrial Hygiene Association (AIHA) NIOSH Proficiency Analytical Testing (PAT) program.
 - d. Air sampling materials and equipment requirements are as follows:
 - 1) Personal sampling shall be performed pursuant to NIOSH Method 7400, phase contrast microscopy.
 - 2) The filter assembly shall be upstream of all other components in the sampling train. An airflow-measuring device (when used) shall be downstream of the filter and the pump assembly, or integral with the pump assembly.
 - 3) Sampling pumps shall supply constant flow.

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- 4) An airflow measuring/metering device shall be used, and shall be high quality rotameter, mass flow, dry gas meter, or critical orifice. Measuring devices shall have a range of at least 1.5 times the desired flow rate and be readable to at least +or -5 % of the desired flow rate. They shall be calibrated against standards of higher accuracy before and after sampling. The calibrations shall be recorded.
- 5) Numbers and frequencies of personal air sampling shall be as required by OSHA regulations but not less than (1) sample per eight (8) hour work shift during times of asbestos removal work.
- 6) Results of sample analysis shall be provided to the Consultant within twenty four (24) hours of collection.
- 7) All other air sampling for compliance with the Specifications shall be performed by the Consultant at no cost to the Contractor except where the Contractor fails specified tests.
- 8) Use a pre-approved "chain of custody" form for all personal air samples collected.

1.11 QUALITY ASSURANCE

A. Notifications, Permits, Warning signs, Labels, and Posters:

1. Provide the required written pre-notification to EPA, SDAPCD, CAL/OSHA, and any other regional, state, and local authority having jurisdiction over the project. Copies of the pre-notifications shall be delivered to the Consultant before any work begins. The Contractor must secure all other permits required for the work, including disposal of asbestos in an approved landfill.
2. Provide the necessary follow-up notices that may be required, obtain all permits, and pay all governmental taxes, fees and other costs in connection with his work. File all necessary drawings, prepare all documents, and obtain all necessary approvals of all governmental departments having jurisdiction.
3. Include in the work, without extra compensation, all labor, materials, services apparatus, to comply with all applicable laws, ordinances, rules, and regulations.
4. All materials and work shall comply with the specifications of the National Fire Protection Association (NFPA), National Electrical Code (NEC/NFPA 70), Underwriters Laboratories (UL), local utility companies, and the County Department of Health, with the California Building Code, and Contract requirements that are in excess of the applicable codes, rules, or regulations. The contract provisions shall be given precedence, unless special permission is granted by the Consultant.
5. Comply with the requirements of the federal, state, and local regulations related to asbestos as listed in herein.
6. Erect OSHA-specified warning signs around the workspace and at every point of potential entry from the outside including the entrance to the decontamination facility's clean room. The signs shall conform to OSHA requirements with the words "Danger, Asbestos Hazard, and Do Not Enter." The warning signs shall be a bright color so that they can be easily noticed. The size of the sign and its lettering shall be no less than OSHA requirements.

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7. Provide OSHA and DOT-required labels as well as NESHAPS labeling requirements for all plastic bags and drums utilized to transport contaminated material from the work areas to the EPA approved disposal landfill.
8. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn workers and visitors of the hazard from asbestos exposure. Also, post in a prominent and convenient place (i.e. the clean room of the decontamination facility) for worker's use a copy of the latest applicable regulations of OSHA, EPA, and NIOSH; and a copy of these Specifications.

B. Electrical Safety Requirements:

1. The non-current carrying parts of fixed, portable, and plug-connected equipment shall be grounded. Portable tools and appliances protected by an approved system of double insulation need not be grounded. All light and power circuits in asbestos removal areas shall be ground fault protected.
2. Extension cords shall be the 3-wire type, shall be protected from damage, and shall not be fastened with staples, hung from nails, or suspended from wires. Splices shall have soldered wire connections with insulation equal to the cable. Worn or frayed cords shall not be used.
3. Safe lighting equipment shall be provided with a preference for floodlights rather than indiscriminate use of unprotected lamps hung from temporary wiring. Exposed bulbs shall be guarded to prevent accidental contact. Temporary wiring shall be properly insulated and substantially supported. Circuits shall be designed and fused. All temporary lighting inside the asbestos work area shall be waterproofed.
4. Receptacles for attachment plugs shall be approved, concealed contact type. Where different voltages, frequencies, or types of current are supplied, receptacles shall be of such design that attachment plugs are not interchangeable.
5. Each disconnecting means for motors and appliances and each service feeder or branch circuit at the point where it originates shall be legibly marked to indicate its purpose.
6. Coordinate all power requirements with the District, including ground fault interrupted (GFI) panel design and extension cord requirements.

C. Scaffolding, Rigging, and Hoisting:

1. Unless otherwise specified, provide all scaffolding, rigging, hoisting, and other services necessary to complete the Work.
2. Remove all equipment from the project site when no longer required, unless written authorization is given by the District and/or Consultant.

D. Emergency Precautions:

1. Establish emergency and fire exits from the work area for the workers. All emergency exits that must pass through a work area shall be equipped with two (2) full sets of protective clothing and respirators at all times.

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2. Notify only the District and parties that are required by law to be notified. District and Consultant shall determine if any agencies other than those required by the law shall be notified.
3. Be prepared to administer appropriate first aid to injured personnel at the site after decontamination. Seriously injured personnel shall be treated immediately in the work area or evacuated without performing decontamination. When an injury occurs, stop work and implement fiber reduction techniques (e.g., water spraying) until the injured person has been removed from the work area.

PART 2 - PRODUCTS

2.1 GENERAL

- A. No materials, equipment, or tools belonging to the District shall be used by the Contractor, except in case of an emergency and upon explicit authorization by the District.
- B. Deliver all materials and equipment to the site in the original containers bearing the name of the manufacturer and details for proper storage and usage.
- C. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner, which shall not interfere with operations of the District.
- D. The District and/or Consultant must approve unloading and temporary storage sites and transfer routes in advance.
- E. Damaged or deteriorated materials may not be used and must be promptly removed from the project site. Materials, that have become contaminated by asbestos-containing materials shall be packaged as ACM, and disposed of in an approved, secure asbestos landfill.
- F. All materials, tools, and equipment must comply at a minimum with this specification and all applicable federal, state, and local regulations.

2.2 MATERIALS

- A. Plastic Sheeting: Sheet shall be fire-retardant polyethylene sized in lengths and widths to minimize the frequency of joints. The minimum thickness shall be that which prevents release of asbestos through tearing, separation, or other reasonably foreseeable means, and in no case shall be thinner than:
 1. 6-mil thick (0.15 mm) for use as wall and floor barriers.
 2. 4-mil thick for use as ceiling barriers and for all other uses.

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- B. Plastic Bags: Bags shall be 6-mil (0.15 mm) minimum polyethylene, or sufficiently thicker for large bags so as to prevent release of asbestos through tearing, separation or other reasonably foreseeable means and shall be labeled with OSHA asbestos warning or capable of being so labeled.
- C. Tape: Tape shall be capable of sealing joints of adjacent sheets of plastic and of attaching plastic sheet to finished or unfinished surfaces of dissimilar materials, and shall be capable of adhering under dry and wet conditions, including wetting by amended water.
- D. Glue: Glue shall be capable of sealing plastic to finished surfaces without damaging the surfaces when removed. Mist or water, encapsulating agent, or any other materials to be used in the work area must not affect the bonding strength and resulting seal integrity.
- E. Surfactants (Wetting Agents): Surfactants shall be used so as to produce a material that result in wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water. Surfactants shall be certified by their manufacturer as complying with EPA regulations controlling the use of volatile organic compounds, and such State and local regulations under an EPA-approved State Implementation Plan.
- F. Encapsulants: Encapsulants shall be classified or certified by Underwriters Laboratories, and shall not degrade the function of any replacement material. They shall be certified by their manufacturer as complying with EPA regulations controlling the use of volatile organic compounds, and such State and local regulations under an EPA-approved State Implementation Plan. For use with fireproofing, any replacement fire-resistive assembly including an encapsulant shall meet the requirements of this specification and existing building requirements, whichever are more stringent, and:
 - 1. Bulk encapsulants. When used as a bulk encapsulant (penetrating or bridging) on fireproofing, the combination of encapsulant and specific fireproofing (trade name) to which it is applied shall be classified or certified by Underwriters Laboratories, and have a maximum flame spread value of 5 or 10 for exposed or concealed fireproofing, respectively, and smoke developed value of 0, when tested in accordance with ASTM Method E 84 or UL Standard 723.
 - 2. Lock-down (post-removal) encapsulants. When used as a lock-down (post-removal) encapsulant on a surface after removal of asbestos-containing material, the encapsulant must be classified or certified by UL for use with the specific fireproofing material (trade name) and applied at the specified rate of application.
- G. Asbestos disposal packaging: Packaging shall be suitable to receive and retain any asbestos-containing materials until disposal or conversion at an approved site. The packaging shall be both air and watertight.
 - 1. Labeling. Packaging of asbestos-containing material shall be labeled in accordance with regulations of EPA (e.g., 40 CFR 61.150), OSHA (e.g., 29 CFR

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- 1926.1101, 8 CCR 1529), DOT (e.g., 49 CFR 172.400, 172.446; except for limited quantity shipments which are not being shipped by air (49 CFR 172.203, 173.155), and State or local occupational safety and health, or environmental agencies (where applicable).
2. Marking. Packaging of asbestos-containing material shall be marked in accordance with DOT regulations (e.g., 49 CFR 172.300); except for limited quantity shipments (49 CFR 172.301).
- H. Warning Signs: Signs shall be as required by EPA (e.g., 40 CFR 61.150), OSHA (e.g., 29 CFR 1926.1101, 8 CCR 1529), State occupational safety and health or environmental agencies (where applicable), and this contract.
- I. Glove bags: Bags shall be made of 10 10-mil (0.25 mm) minimum clear polyethylene. Bag shape shall include "shoulders" to be used with straps. Sizes and shapes chosen shall be suitable for the pipe and fitting formations included in this contract. The bags shall have a closure system, such as a double zipper or self-closing cloth strip. The bags shall have a zipper lock or equivalent feature, which seals the lower part of the bag from the top part to remove asbestos- containing debris.
- J. Brushes: All brushes shall have nylon bristles. Wire brushes are excluded from use due to their potential to shred asbestos fibers into smaller fibers. Wire brushes may be used on pipe joint insulation and flooring mastics upon prior written approval from the District and Consultant.

2.3 TOOLS AND EQUIPMENT

- A. Airless Sprayer: Amended water and surface sealers shall be applied with an airless or other low-pressure sprayer suitable for the specific application.
- B. HEPA-Filtered Exhausts: Air inside the asbestos removal area shall be exhausted to the atmosphere (i.e. building exterior) through a High Efficiency Particulate Air (HEPA) filter.
1. A sufficient number of HEPA-filtered portable exhaust units shall be provided for each work area in order to provide:
 - a. At least four (4) complete changes of air per hour;
 - b. An inward velocity through all openings of at least 200 fpm;
 - c. A static negative pressure of at least 0.02 inches of water.
 2. The HEPA-filter shall be preceded by replaceable pre-filters and the unit must be designed such that it cannot be operated unless the HEPA-filter is in place.
 3. The units must be designed with lights and alarms that indicate that the filters are properly installed and function and that determine when the filters must be changed.
 4. Flexible metal or similar materials hose(s) (e.g. ducts) of sufficient length must also be provided to allow the units to discharge to the exterior of the building.

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- C. Vacuum Equipment: All vacuum equipment used for cleaning up shall be HEPA-filtered. At least one HEPA vacuum shall be equipped with floor (hard surface and carpet) cleaning attachments.
- D. Scaffolding/Staging/Ladders: Shall meet OSHA safety regulations, including 29 CFR 1926.450-452. Where electrical power and water are used inside a work area, no electrically conductive ladders (e.g., aluminum or steel) shall be used (except for hinges and feet).
- E. Transportation: Transportation methods shall comply with the provisions of EPA Title 40, Part 61, Subparts A, and B and with any hazardous or special waste regulations for temporary storage, transport, and disposal if such codes are enforced in states or cities where the waste will be generated, stored, transported, or disposed of. All containers shall be labeled in accordance with 8 CCR 1529, 29 CFR 1926.58(K) (2), 40 CFR 61, Subparts A and M, and 49 CFR Parts 171 and 172, Hazardous Waste Substances: Final Rule.
- F. Other Tools and Equipment: Furnish all equipment such as lumber, nails, ladders, HEPA vacuums, and hardware and supplies, which may be required to construct and dismantle the decontamination areas and the barriers that isolate the work area. Provide other suitable tools for the abatement activities including hand scrapers, wire brushes, sponges, mops, and shovels.
- G. Electrical: Electrical tools and equipment shall meet all applicable codes and regulations, including, in particular, 8 CCR 1760, 29 CFR 1910.304 and 29 CFR 1926.400-449.
 - 1. Grounding. Ground fault circuit-interrupters shall always be used for all electrical equipment, except to the extent provided in an assured equipment grounding conductor program, 29 CFR 1926.404, if established and implemented in the Plan of Action.
 - 2. Additional requirements. Other OSHA requirements for equipment grounding conductors, beyond those described in the grounding paragraph, apply.

PART 3 - EXECUTION

3.1 WORK AREA PREPARATION

- A. Prepare the work area as described in this section. Preparation work shall be performed according to the following general sequence of steps and procedures to insure that proper containment and protection systems are installed prior to any work, which could generate airborne asbestos fibers:
 - 1. Remove and relocate any non-fixed items (not removed by the District) to storage areas designated by the District.

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2. HVAC: Isolate, clean by HEPA vacuuming and washing, and seal airtight with plastic and tape all HVAC system diffuses, grills, and registers in or servicing the work area.
 3. Pre-cleaning: Carefully clean all surfaces in the work area that may be contaminated with any dust or debris by using wet methods and a vacuum equipped with a HEPA filter. Comply with Article "Pre-Cleaning of Asbestos Contaminated Surfaces."
 4. Isolate all electrical systems as directed by the District and provide temporary power and lighting as required for the work area and affected non-work areas. Comply with Article "Electrical Systems."
 5. Barriers: Cover any window or other opening with polyethylene sheeting. All walls to remain shall also be protected from damage during the work and erect or install Decontamination Facility and HEPA exhaust system.
 6. Installation of Decontamination System: Install the decontamination enclosure system.
 7. Signage: Post adequate warning signs denoting the potential danger of airborne asbestos at designated entrances to work areas including, as a minimum, those described at 29 CFR 1926.1101, 8 CCR 1529, and State occupational safety and health and fire safety regulations (where applicable). Prevent access to posted areas by unauthorized or inadequately protected persons.
 8. Fire equipment: Adequate portable fire extinguisher equipment shall be maintained within the work area meeting at least the requirements of 8 CCR 1922, 29 CFR 1910.157 and (where applicable) State occupational safety and health regulations and fire safety regulations.
- B. Obtain Consultant's approval of all preparation work before starting removal of asbestos material.

3.2 ELECTRICAL SYSTEMS

- A. The scope of the required electrical isolation and protection work includes isolation and protection of electrical equipment, which is in the area from which asbestos must be removed, and could therefore possibly become a hazard through contact or water spray short-circuiting. Shutdown of electrical circuits shall include providing labor to monitor, inspect, and service temporary power circuits, lighting, and equipment as required by local codes and regulations. Provide "Lock Out" system on all electrical panels or equipment that will be shut off during the removal process.
- B. Provide temporary lighting in the work area where asbestos removal is performed. Inspect the removal work area for the condition of electrical conduit and junction boxes. Correct all potentially unsafe conditions. Do not proceed with removal work until all potentially unsafe conditions have been corrected.
- C. All materials and workmanship shall conform to the latest editions of the following codes, standards, and specifications:
1. National Electrical Code (NEC) - most recent edition.
 2. National Bureau of Standards, Handbook H30, National Electrical Safety Code.

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3. State and Local codes, and all other authorities having jurisdiction.
 4. Underwriter Laboratories (UL).
 5. National Board of Fire Underwriters.
 6. California-OSHA.
- D. Temporary lighting and power systems shall meet or exceed all OSHA, state, and local regulations; temporary lighting levels shall meet or exceed OSHA requirements and provide surface lighting for nighttime work.
- E. Visit the site as necessary to investigate existing electrical conditions and isolation requirements.
- F. Prior to switching circuits at panels, review the existing directory. Do not shut down any circuits without advanced notification and approval of the District.
- G. All costs associated with the isolation of electrical systems and installation of temporary power and lighting shall be borne by the Contractor.
- H. Comply with all applicable electrical safety regulations.

3.3 PRE-CLEANING OF ASBESTOS CONTAMINATED SURFACES

- A. Cleaning of surfaces that are potentially contaminated with asbestos-containing dust and debris shall be required to prevent this dust from becoming airborne and posing an exposure risk, or interfering with perimeter air monitoring activities. Cleaning action shall be performed as a preliminary exposure control procedure, prior to performing other actions associated with the Work.
- B. Cleaning shall consist of HEPA vacuuming followed by wet mopping or wiping of surfaces in a manner that prevents dust generation, but effectively rids the surface of all visible debris, dust, film, and grime.
- C. Each HEPA vacuum shall be separately equipped with an airtight, securely attached hose of appropriate length and a collection wand, brush or other special attachment appropriate to the required cleaning task. The equipment shall be operable at all times and shall contain no air leaks. The Consultant will review verification of the efficiency of the equipment's filtration (i.e. manufacturer's equipment data sheets).
- D. Cleaning Procedures:
1. Remove large pieces of debris by hand, and then dry vacuum all surfaces using HEPA filtered equipment and a collection attachment that minimizes dust generation.
 2. Lightly wet the surface of any material that produces airborne fibers using an airless sprayer and amended water.
 3. Collect, package, label, and dispose of vacuumed material as asbestos-contaminated waste.

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4. Thoroughly wet wipe or mop all surfaces to remove any remaining dirt or grime, being careful not to wet or damage any electrical equipment, furniture, or other sensitive surfaces.
5. All surfaces to completely dry, then inspect the surfaces for any visible remaining dirt or fibrous material.
6. HEPA vacuum any remaining dirt or grime using an efficient collection attachment.
7. Collect and pump all wastewater through a 5-micron filter, utilizing a multistage filtration system. Dispose of filtered material and filter as asbestos waste.
8. Request that the Consultant perform a visual inspection of the cleaning work, prior to continuing any other specified actions.

3.4 ISOLATION OF OSHA CLASS I (FRIABLE) CONTAINMENT WORK AREAS

A. Work Area Isolation and Protection for Friable Asbestos-Containing Materials:

1. Isolate the work area for the duration of work by completely closing and sealing all openings and doorways into the work area, including heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation/sealing shall be accomplished by using two (2) layers of 6-mil plastic sheeting taped securely in place, or by caulking, including the construction as noted in numbers 4 and 5 below. The work area shall be protected and sealed airtight to the extent possible, and be subject to the approval of the Consultant.
2. Emergency and fire exits shall be maintained.
3. Shutdown and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the property.
4. Thoroughly pre-clean all dust or debris from any fixed objects, floors, walls, or other equipment within the work area using HEPA vacuuming equipment and wet washing. Do not use dry brooms, brushes, mops, or non-HEPA vacuum cleaners for this pre-cleaning work. Seal all seams, joints, covers, or casings with tape, and enclosed fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.
5. Cover floor and walls with a minimum two (2) independent layers of 6-mil plastic sheeting, turning each layer up onto walls a minimum of 16" and fasten securely to wall. Cover walls with two (2) layers of 6-mil plastic sheet extending to floor, overlapping the two (2) floor sheets by not less than 12" excluding the turn-up. All joints in plastic sheets shall be taped and glued in a manner to prohibit air movement, and to prevent passage of water or other liquids. The bottom layer of floor poly shall be securely fastened to the floor to prevent creases or slippage that would pose a hazard to workers. Any floor drains or other openings shall be sealed individually with two (2) layers of 6-mil sheeting and tape, and then covered by the remaining two (2) layers of poly. Pits, pumps, and other openings shall be covered to prevent a tripping hazard and then covered with two (2) layers of 6-mil sheeting.
6. Install work area HEPA-filtered exhaust systems as previously specified in Section 1.6 (J) of these Specifications.
7. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58 (k)(1).and (k)(2)(ii) at the outside

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doorway to the decontamination facility which shall be the only non-emergency entrance into the work area. The Consultant may also request that the Contractor post additional warning signs around the work area or at other potential entrances or exposure points in accordance with California Proposition 65.

8. Warning signs shall be readily visible to any person attempting to enter the work area.
9. All waste shall be disposed of as hazardous waste and packaged as specified herein.
10. Negative pressure will be established in the work area by placement and operation of sufficient number of HEPA-filtered portable exhaust units in order to provide:
 - a. At least four (4) complete changes of air per hour;
 - b. An inward velocity through all openings of at least 200 fpm;
 - c. A static negative pressure of at least 0.02 inches of water.
11. Negative pressure shall be measured and recorded using a pressure differential monitor (manometer or magnehelic-type). The monitor shall be calibrated according to the manufacturer specifications and equipped with a printer.

- B. After the friable asbestos removal work area has been prepared as specified above, request a formal site inspection by the Consultant. No removal, demolition or other disturbance of asbestos-containing material, dust, or debris shall occur until the Consultant has inspected and approved the site preparation work.

3.5 ISOLATION OF OSHA CLASS II (NON-FRIABLE) CONTAINMENT WORK AREAS

- A. Work Area Isolation and Protection of Non-Friable Asbestos-Containing Materials Located on the Interior of a Building:
 1. Isolate the work area for the duration of work by completely closing and sealing all openings and doorways into the work area, including heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation/sealing shall be accomplished by using two (2) layers of 6-mil plastic sheeting taped securely in place, or by caulking. The work area shall be protected and sealed airtight to the extent possible, and be subject to the approval of the Consultant.
 2. Emergency and fire exits shall be maintained.
 3. Shutdown and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the property.
 4. Thoroughly pre-clean all dust or debris from any fixed objects, floors, walls, or other equipment within the work area using HEPA vacuuming equipment and wet washing. Do not use dry brooms, brushes, mops, or non-HEPA vacuum cleaners for pre-cleaning work.
 5. Seal all seams, joints, covers, or casings with tape, and enclosed fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.

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6. Cover walls with one (1) layer of 6-mil plastic sheet extending a minimum of four feet from floor (splashguards). All joints in plastic sheets shall be taped and glued in a manner to prohibit air movement, and to prevent passage of water or other liquids.
 7. Any floor drains or other openings shall be sealed individually with two (2) layers of 6-mil sheeting and tape. Pits, pumps, and other openings shall be covered to prevent a tripping hazard and then covered with two (2) layers of 6-mil sheeting.
 8. Install work area HEPA-filtered exhaust systems as previously specified herein.
 9. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58(k)(1) and (k)(2)(ii) at the outside doorway to the decontamination facility which shall be the only non-emergency entrance into the work area.
 10. Warning signs shall be readily visible to any person attempting to, enter the work area.
 11. All waste will be disposed of as non-hazard waste and packaged as specified herein.
- B. Work Area Isolation and Protection of Non-Friable Asbestos-Containing Roofing Materials:
1. Install plastic sheeting, for use as drop cloths, around the perimeter of the building, where necessary.
 2. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58(k)(1) and (k)(2)(ii) at the edges of the plastic sheeting and at the access point to the roof.
 3. Warning signs shall be readily visible to any person attempting to access the roof of the building.
 4. Isolate roof level heating and ventilation air intake sources or shall arrange with the District to have the ventilation system shut down. The work area shall be subject to the approval of the Consultant.
 5. Seal all seams, joints, covers, or casings with tape, and enclosed fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.
- C. Work Area Isolation and Protection of Outdoor Non-Friable Asbestos-Containing Cementitious Asbestos-Containing Siding, Shingles, or Transite Panels.
1. Install plastic sheeting, for use as drop cloths, around the perimeter of the building, where removal is to occur.
 2. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58(k)(1) and (k)(2)(ii) at the edges of the plastic sheeting.
 3. Warning signs shall be readily visible to any person approaching the work area.
 4. Isolate the work area from the interior of the building by completely closing and sealing all openings and doorways from the work area into the building, including heating and ventilation ducts, doorways, and windows. The work area shall be subject to the approval of the Consultant.

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5. Seal all seams, joints, covers, or casings with tape, and enclosed fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.
- D. After the non-friable asbestos removal work area has been prepared as specified above, request a formal site inspection by the Consultant. No removal, demolition or other disturbance of asbestos-containing material, dust, or debris shall occur until the Consultant has inspected and approved the site preparation work.

3.6 ISOLATION OF ACCM REMOVAL AREAS

- A. Work Area Isolation and Protection of Asbestos-Containing Materials:
 1. For interior work areas, isolate the work area for the duration of work by completely closing and sealing all openings and doorways into the work area, including heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation shall be accomplished by using one (1) layer of 6-mil plastic sheeting taped securely in place, or by caulking, including the construction as noted in number 2 below. The work area shall be protected and sealed airtight to the extent possible, and be subject to the approval of the Consultant.
 2. For exterior work areas, seal all openings and doorways to the interior of the building within the work area, including heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation shall be accomplished by using one (1) layers of 6-mil plastic sheeting taped securely in place, or by caulking. The work area shall be segregated from the interior of the building, to the extent possible, and be subject to the approval of the Consultant.
 3. Emergency and fire exits shall be maintained.
 4. Shutdown and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the property.
 5. Cover floor with one layer of 6-mil plastic sheeting, to serve as a drop cloth.
 6. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58(k)(1) and (k)(2)(ii) at the entry to the work area which shall be the only non-emergency entrance into the work area.
 7. Warning signs shall be readily visible to any person attempting to, enter the work area.
 8. All waste will be disposed of as construction debris and packaged as specified herein.
 9. Intact ACCM may be left on or in a building during demolition operations if the ACCM Removal Operations listed specified herein are followed throughout the course of the building demolition
- B. After the ACCM removal work area has been prepared as specified above, request a formal site inspection by the Consultant. No removal, demolition or other disturbance of asbestos-containing construction material, dust, or debris shall occur until the Consultant has inspected and approved the site preparation work.

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3.7 REMOVAL PROCEDURES FOR ALL OPERATIONS

- A. Vacuum cleaners equipped with HEPA filters shall be used to collect all debris and dust containing ACM and PACM.
- B. Wet methods shall be used to control exposure during any asbestos handling, removal, cutting, and clean-up, unless the Contractor can demonstrate that the use of wet methods is infeasible due to (for example) creation of an electrical hazard or safety hazard during roofing abatement. Any exceptions to the requirement for wet methods must be approved in advance by the District or Consultant.
- C. Waste and debris contaminated with asbestos must be promptly cleaned-up and stored in leak-tight containers or impermeably wrapped.

3.8 OSHA CLASS I (FRIABLE) REMOVAL PROCEDURES

- A. Friable materials may include the removal of floor tile and adhesive by mechanical methods.
- B. Amended water (wetting agent) mixed and carefully applied using an airless sprayer as specified by the manufacturer, shall continuously be used to control the release of asbestos fibers from the material prior to and during removal. The amended water shall be applied in sufficient quantity to fully penetrate and saturate the material before it is removed. Wetting shall commence up to 24 hours before removal work to ensure effectiveness.
- C. Removal Methods:
 - 1. No asbestos removal work shall begin until the work area has been prepared and approved by the Consultant.
 - 2. Removal workers shall wear minimally half face air-purifying respirators with P-100 filters and protective clothing as previously described throughout all removal, cleanup, and waste handling operations.
 - 3. Small test patches of asbestos material shall be wetted, and then removed and examined by the Consultant and Supervisor to determine degree of saturation prior to removing the bulk of the material. With prior approval, the Contractor may use removal encapsulants instead of amended water; applied per manufacturer's and federal guidelines.
 - 4. After large areas of the asbestos material have been fully wetted and tested, the asbestos shall be carefully removed in small sections by using hand scrapers or other suitable tools or mechanical devices as allowed by federal, state, and local regulations. This includes chemical removal of floor tile mastic in association with mechanical buffers and/or use of a bead blaster.
 - 5. As the material is removed, it shall be promptly wetted and packed into impermeable, labeled 6-mil polyethylene, disposal bags. When each bag is full, the packaged material shall be sprayed with amended water, sealed (using duct tape or other fastener as approved by the Consultant), and transported to a temporary storage area inside the work area.

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6. Repeatedly spray the material to prevent it from drying out.
 7. After obtaining written approval of the cleaning from the Consultant, seal all substrate surfaces from which asbestos material was removed with at least one (1) coat of an approved penetrating encapsulant.
 8. Minimize contamination of the work floor, the exterior of disposal containers, and all other surfaces within the work area. At the end of each shift, all surfaces shall be cleaned of all materials and then HEPA vacuumed or wet mopped.
 9. Workers must enter and exit the regulated work area through a decontamination facility. The decontamination facility and work area entry/exit procedures must meet the requirements of 9 CCR 1529 (j)(1).
 10. The decontamination facility shall be wet cleaned (a minimum of two times) using wet cleaning methods upon completion of any waste removal when the worker decontamination facility's shower room alternates as a waste container wash room. The shower room shall be washed with cloths or mops saturated with a detergent solution immediately prior to wet cleaning.
 11. The decontamination facility shall be wet cleaned and HEPA vacuumed, as appropriate, after each shift change and meal break.
 12. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.
- D. Upon completion of removal work, but prior to commencing encapsulation or post-removal cleaning of the work area, request the Consultant conduct an inspection and approve the removal work.

3.9 OSHA CLASS II (NON-FRIABLE) REMOVAL PROCEDURES

- A. Non-friable friable materials may include floor tile and adhesive removed by hand tools.
- B. Amended water (wetting agent) mixed and carefully applied using an airless sprayer as specified by the manufacturer, shall continuously be used to control the release of asbestos fibers from the material prior to and during removal. The amended water shall be applied in sufficient quantity to fully saturate the material before it is removed. Wetting shall commence up to 24 hours before removal work to ensure effectiveness.
- C. Removal Methods:
1. No asbestos removal work shall begin until the work area has been prepared and approved by the Consultant.
 2. Removal workers shall wear minimally half face air-purifying respirators with P-100 filters and protective clothing as previously described throughout all removal, cleanup, and waste handling operations.
 3. Small test patches of asbestos material shall be wetted, and then removed and examined by the Consultant and Supervisor to determine degree of saturation prior to removing the bulk of the material. With prior approval, the Contractor may use removal encapsulants instead of amended water; applied per manufacturer's and federal guidelines.
 4. After large areas of the asbestos material have been fully wetted and tested, the asbestos shall be carefully removed in small sections by using hand scrapers or

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other suitable hand tools. No tools or equipment shall be used to render material friable without prior approval by District. Floor tile and mastic will be removed with hand tools and wet methods.

5. As the material is removed, it shall be promptly wetted and packed into impermeable, labeled 6-mil polyethylene, disposal bags. When each bag is full, the packaged material shall be sprayed with amended water, sealed (using duct tape or other fastener as approved by the Consultant), and transported to a temporary storage area inside the work area.
6. Material shall not be dropped or thrown to the ground. Removed asbestos-containing roofing material, siding, panels, or shingles shall be passed to the ground by hand or lowered to the ground via a covered, dust-tight chute, crane, or hoist.
7. Repeatedly spray the material to prevent it from drying out.
8. After obtaining written approval of the cleaning from the Consultant, seal all substrate surfaces from which asbestos material was removed with at least one (1) coat of an approved penetrating encapsulant.
9. Minimize contamination of the work floor, the exterior of disposal containers and all other surfaces within the work area. At the end of each shift, all surfaces shall be cleaned of all materials and then HEPA vacuumed or wet mopped.
10. Workers must enter and exit the regulated work area through a decontamination facility. The decontamination facility and work area entry/exit procedures must meet the requirements of 29 CCR 1529 (j)(2).
11. The decontamination facility shall be wet cleaned (a minimum of two times) using wet cleaning methods upon completion of any waste removal when the worker decontamination facility's shower room alternates as a waste container wash room, the shower room shall be washed with cloths or mops saturated with a detergent solution immediately prior to wet cleaning.
12. The decontamination facility shall be wet cleaned and HEPA vacuumed, as appropriate, after each shift change and meal break.
13. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.

D. Upon completion of removal work, but prior to commencing encapsulation or post-removal cleaning of the work area, request the Consultant conduct an inspection and approve the removal work.

E. All asbestos-containing materials shall be removed, gross debris cleaned up, and waste bags removed from the work area prior to approval from the Consultant.

3.10 ACCM REMOVAL PROCEDURES

A. Amended water (wetting agent) mixed and carefully applied using an airless sprayer as specified by the manufacturer, shall continuously be used to control the release of asbestos fibers from the material prior to and during removal. The amended water shall be applied in sufficient quantity to fully saturate the material before it is removed. Wetting shall commence up to 24 hours before removal work to ensure effectiveness.

B. Removal Methods:

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1. No asbestos removal work shall begin until the work area has been prepared and approved by the Consultant.
 2. Removal workers shall wear half face air-purifying respirators with P-100 filters and protective clothing as previously described throughout all removal, cleanup, and waste handling operations.
 3. Small test patches of asbestos material shall be wetted, and then removed and examined by the Consultant and Supervisor to determine degree of saturation prior to removing the bulk of the material. With prior approval, the Contractor may use removal encapsulants instead of amended water; applied per manufacturer's and federal guidelines.
 4. After large areas of the asbestos material have been fully wetted and tested, the asbestos shall be carefully removed in small sections by using hand scrapers or other suitable hand tools. No tools or equipment shall be used to render material friable without prior approval by District. Floor tile and mastic shall be removed with hand tools and wet methods.
 5. As the material is removed, it shall be promptly wetted and packed into impermeable, labeled 6-mil polyethylene, disposal bags. When each bag is full, the packaged material shall be sprayed with amended water, sealed (using duct tape or other fastener as approved by the Consultant), and transported to a temporary storage area inside the work area.
 6. Repeatedly spray the material to prevent it from drying out.
 7. Minimize contamination of the work floor, the exterior of disposal containers and all other surfaces within the work area. At the end of each shift, all surfaces shall be cleaned of all materials and then HEPA vacuumed or wet mopped.
 8. The decontamination facility shall be wet cleaned (a minimum of two times) using wet cleaning methods upon completion of any waste removal when the worker decontamination facility's shower room alternates as a waste container wash room, the shower room shall be washed with cloths or mops saturated with a detergent solution immediately prior to wet cleaning.
 9. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.
- C. Upon completion of removal work, but prior to commencing encapsulation or post-removal cleaning of the work area, request the Consultant conduct an inspection and approve the removal work.

3.11 CLEANING AND FINAL DECONTAMINATION

- A. After all asbestos-containing (or contaminated) materials have been removed, remove all wastes and perform a thorough multi-stage final cleanup and decontamination of the work area per the methods indicated below. Final cleaning shall be performed only after all waste is packaged and removed, but prior to re-installing equipment or dismantling any barriers, decontamination facility, or protective coverings. Cleaning shall be performed before a visual inspection and air testing by the Consultant. HEPA-exhaust systems shall operate continuously throughout the cleaning and air testing process until the Consultant authorizes their shutdown and removal from the site. Notify the Consultant at least 24 hours in advance of the expected completion time of site cleaning in order to allow the scheduling of air clearance testing.

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- B. Methods and Approvals: Cleaning methods and approvals shall consist of the following tasks performed in the list order:
1. Remove all visible accumulations of asbestos debris on the protective coverings on floors, walls, and other surfaces, and then HEPA vacuum all surfaces to pick up excess water and gross saturated debris.
 2. After HEPA vacuuming, the work area air shall be lightly misted (with amended water), and then all protective coverings on ceilings, walls, floors, and other items in the work area shall be wiped thoroughly clean (first cleaning).
 3. After completing the above steps (1) and (2), request the Consultant to inspect the site. To facilitate scheduling of this inspection, notify the Consultant of the anticipated completion time of the above initial cleaning work 24 hours in advance.
 4. If the Consultant observes any asbestos waste or fibers within the work area during the inspection, perform additional cleanup and decontamination as directed by the Consultant.
 5. If the Consultant approves this first cleaning, slowly remove the upper layer of all protective poly coverings on floors, walls, and other surfaces and package them in 6-mil waste bags. The waste bags shall then be removed from the work area. The bottom layer of protective poly coverings, the decontamination facilities, the HEPA exhaust systems, all barrier walls, and seals on HVAC components shall remain in place and in use.
 6. After these upper protective coverings are moved, the work area shall be completely wet wiped and vacated for at least twelve (12) hours to allow fiber settling and while the Consultant collects and analyzes a final set of air samples according to NIOSH Method 7400 (PCM).
 7. Upon obtaining the Consultant's written approval of final clean work area as specified herein, unless otherwise permitted, drying time shall be as specified by the manufacturer before final air sampling is conducted.
 8. After successful completion of final air clearance testing as specified herein, carefully remove in listed order the decontamination facilities, any temporary barrier walls or tunnels, seals on HVAC components. The HEPA exhaust systems shall be removed only after all other items are removed. A HEPA vacuum shall be kept on site during this final disassembly work to cleanup any dust or debris.
 9. If any of the post cleaning PCM air sample results are above 0.01 fiber/cc (or a preexisting level of normal background fibers if shown to be higher than 0.01 f/cc by the Consultant), the Consultant may require additional cleaning, decontamination, air testing and a final inspection, which shall be repeated by the Consultant.
 10. Workers shall wear approved respiratory and personnel protective equipment throughout all cleanup and waste disposal activities.

3.12 DISPOSAL

- A. Determine current waste handling, packaging, labeling, transportation, and disposal regulations for the work site and for each waste disposal landfill. Comply fully with

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these regulations and all U.S. Department of Transportation, EPA requirements and state and local regulations.

- B. Definition: Wastes are defined as all asbestos-containing or potentially contaminated materials or other items, which have not been completely cleaned or sealed to the satisfaction of the Consultant, while inside the work area, and must be removed from the job site. Asbestos wastes may include building materials, insulation, disposal clothing and protective equipment, plastic sheeting and tape, exhaust systems or vacuum filters, Contractor equipment, or other materials designated by state or local authorities or the Consultant or which have been potentially contaminated with asbestos and have not been fully cleaned inside the work area by vacuuming followed by thorough washing.
- C. All waste material shall be promptly placed in 6-rnil polyethylene bags as it is generated. A sufficient number of waste bags shall be located in the immediate work area, and in the Equipment (dirty) room of the Worker Decontamination Facility. Count the bags and estimate the total volume leaving the work area, and maintain a written record of such (waste log).
- D. Warning labels, having waterproof print and permanent adhesive, imprinted on the sides of all waste bags or transfer containers. All waste bags must have the generator's name and address including area where waste was generated.
- E. A fine water spray shall be used to keep the waste in containers thoroughly wet at all times. When a waste bag is full, it shall be securely sealed with tape or other secure fastener.
- F. The following procedures shall be followed whenever containers or equipment are removed, from the work area:
 - 1. All combustible rubbish and debris, including properly bagged asbestos shall be properly disposed of at the end of each working day.
 - 2. The Clean Room shall be considered a holding area only during the period of active waste transfer for the purpose of the loading of carts or drums. Storage of waste in carts or a drum in the clean room is prohibited.
 - 3. Waste removal shall not occur during worker shift changes or when workers are showering or changing. Care shall be taken to prevent short-circuiting and cycling of air outward through the shower and clean room when used for waste removal.
 - 4. Workers are to be stationed in each room/area of the decontamination facility to transfer the containers and equipment to or from adjacent sections. These workers in the clean room or holding area shall enter from uncontaminated areas with appropriate personal protective equipment; or prior to the start of the waste transfer, these workers shall exit the work area, fully de-contaminated, and subsequently don't clean personal protective equipment.
 - 5. External surfaces of contaminated containers and equipment shall be cleaned by wet cleaning and HEPA-vacuuming in the work area before moving such items into the decontamination facility airlock. Workers shall not enter the airlock during this procedure.

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6. The containers of waste and the equipment shall be removed from the airlock by workers stationed in the washroom during waste removal operations.
 7. Once in the washroom, external surfaces of contaminated containers and equipment shall be cleaned a second time by wet cleaning.
 8. The cleaned containers of waste and equipment shall be placed in uncontaminated leak-tight plastic bags (or 6-mil sheeting if physical characteristics necessitate and permit). Air volume shall be minimized, and the bags or sheeting shall be sealed. Items that may puncture or tear the plastic bags or sheeting shall be placed in a hard wall container such as a drum, and then sealed.
 9. The clean re-containerized items shall be moved into the airlock for subsequent transfer to the holding area. The washroom workers shall not enter this airlock or the work area until waste removal is finished for the period.
 10. Re-containerized items and cleaned equipment shall be removed from the air lock to the holding area by workers who have entered from uncontaminated areas with appropriate personal protective equipment.
 11. The re-containerized items of waste and cleaned, bagged equipment shall be placed in open top, watertight plastic carts or drums. The carts or drums shall be HEPA-vacuumed and wet cleaned immediately following the removal of the containers of waste from them, and the location of where they are emptied shall be HEPA-vacuumed.
 12. The exit from the waste decontamination facility shall be monitored and secured at all times to prevent unauthorized entry.
 13. The carts and drums may be temporarily stored in a holding area at the work site outside the work place until a transport vehicle arrives, but such storage areas must be pre-approved by the District.
- G. Waste Container Storage: Sealed waste bags may be temporarily stored in a pre-designated and approved outside area, until a truckload quantity is obtained. The temporary storage area shall be predominantly identified and posted with signs, and waste containers shall be covered with polyethylene sheeting or otherwise protected from further contamination.
- H. Waste Removal Scheduling: All waste containers shall be decontaminated and removed from the site before final cleanup is started and isolation barriers are taken down. Pre-schedule and obtain approval of the Consultant for all time periods during which he desires to re-move waste bags from the facility. Once a truckload of waste containers has accumulated, arrange for transportation to the disposal site. Waste shall not be stored in the work area or waste decontamination facilities. Outside bag, storage must be monitored and secured at all times to prevent tampering. Storage must be in secure areas.
- I. Waste Transportation and Disposal Regulations:
1. Determine and insure compliance with: 1) the current waste handling regulations applicable to each work site; and 2) the current regulations for transporting and disposing, waste at each ultimate disposal landfill. Comply fully with these regulations and with all U.S. Department of Transportation, State, EPA, and all federal and local requirements.

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2. At no additional cost to the District, maintain a valid solid waste transportation registration issued by the California Department of Health Services Toxic Substance Division and obtain, complete, and fully comply with any other local hazardous waste manifesting requirements.
3. Transportation methods shall comply with the provisions of EPA Title 40, Part 61, Subpart M, Title 22 of the California Administrative Code, Division 4 Environmental Health, Chapter 30, Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes, and with any hazardous waste regulations for temporary storage, transport, and disposal if such codes are enforced in states where the waste shall be stored, transported or disposed of.

J. Waste Container Removal and Disposal Procedure:

1. Provide waste packaging, transportation, and approved landfill disposal, plus all related recordkeeping.
2. Package, label, and remove all asbestos waste as specified. Packaging shall be accomplished in a manner that minimizes waste volume, but ensures waste containers shall not tear or break.
3. Provide legal transportation of asbestos wastes to the disposal landfill. Verify actual delivery, receipt, and disposal of each load of waste at the design landfill.

3.13 FINAL INSPECTION AND TESTING

- A. After a minimum of two (2) thorough cleanings of the work area, if a high degree of cleanliness has been achieved, notify the Consultant that the work area is ready for inspection and final testing. The Consultant and the Contractor shall visually inspect the work area for detection of any visible asbestos dust, debris or other contamination. If the visual inspection does not detect any dust, debris or other signs of contamination, final air testing shall commence.
- B. The final test shall consist of collecting air samples within the work area to establish that the airborne fiber concentrations do not exceed 0.01 f/cc, as determined by transmission electron microscopy (TEM) for Class I removal areas and phase contrast microscopy (PCM) for Class II removal areas. At the discretion of the District TEM may also be employed for one or two of the samples in Class II areas to confirm the results of the final testing via PCM. If the results of the final testing exceed 0.01 f/cc, thorough wet cleaning, and/or HEPA vacuuming shall be repeated until the required clearance levels are achieved.
- C. After achieving the levels of cleanliness and decontamination, as specified herein and as confirmed by the final inspection and air testing, the Consultant and Contractor shall thoroughly inspect the work area to determine whether any damage has been done to finishes, equipment, or any other part of the work space.
- D. Any damage to finishes, floors, walls, or other items or fixtures that have been the result of actions by the Contractor shall be repaired to original condition without any additional cost to District. A comparison to the pre-construction inspection report shall be the basis for the assessment of damages to be addressed.

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END OF SECTION 02 82 33

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SECTION 02 83 33**REMOVAL AND DISPOSAL OF MATERIAL CONTAINING LEAD****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.
- B. Hazardous Building Materials Survey Reports, prepared by the District's Consultant, are available from the District Construction Manager.

1.2 REFERENCE DOCUMENTS

- A. The current issue of the following documents are incorporated herein and shall govern the conduct of the Work. Where conflict among requirements or with this specification exists, the more stringent requirements shall apply.
- B. Code of Federal Regulations (CFR):
 - 1. 29 CFR 1910, Occupational Safety and Health Standards, General.
 - 2. 29 CFR 1910.134 Respiratory Protection.
 - 3. 29 CFR 1910.1025 Lead.
 - 4. 29 CFR 1910.1200, Hazard Communication.
 - 5. 29 CFR 1926 Occupational Safety and Health Standards, Construction.
 - 6. 29 CFR 1926.55, Gases, Vapors, Fumes, Dusts, and Mists.
 - 7. 29 CFR 1926.59, Hazard Communication.
 - 8. 40 CFR 61 Subpart A and Subpart M, USEPA, National Emission Standards for Hazardous Air Pollutants (NESHAP).
 - 9. 40 CFR 261, Identification and Listing of Hazardous Waste
 - 10. 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
 - 11. 40 CFR 263, Standards Applicable to Transporters of Hazardous Waste
 - 12. 40 CFR 266, Standards for the Management of Specific Hazardous Wastes.
 - 13. 40 CFR 745, Lead Renovation, Repair, and Painting Program.
- C. California Code of Regulations (CCR):
 - 1. Title 5, Sections 32240 through 32045, Lead Safe Schools Protection Act.
 - 2. Title 8, Section 1514, Personal Protective Equipment.
 - 3. Title 8, Section 1531 Construction Respiratory Protective Equipment.
 - 4. Title 8, Section 15 32 .1, Lead in the Construction Industry.
 - 5. Title 8, Section 3203, Injury and Illness Prevention Program.
 - 6. Title 8, Section 5144, Respiratory Protective Equipment.
 - 7. Title 8, Section 5155, Airborne Contaminants.

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8. Title 8, Section 5194, Hazard Communication.
9. Title 8, Section 5216 General Industry Construction Safety Orders, Lead Regulations.
10. Title 17 Sections 35001-36100 Accreditation, Certification and Work Practices for Lead Based Paint and Lead Hazards.
11. Title 22, Division 4, Minimum Standards for Management of hazardous and extremely hazardous waste.

D. Local Regulations:

1. San Diego Municipal Code, Division 10, Sections 54.1001-54.1015, Lead Hazard Prevention and Control Ordinance.

E. American National Standards Institute (ANSI):

1. ANSI Standard Z9.2 Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems.

F. American Society for Testing and Materials (ASTM):

1. ASTM Standard E1728 Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination.

G. Testing Methods:

1. NIOSH Method 7082, Lead by Flame Atomic Absorption Spectrophotometry.
2. EPA Publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.
3. EPA Testing Method 3050B, Acid Digestion of Sediments, Sludges, and Soils.
4. EPA Method 7420, Lead (Atomic Absorption, Direct Aspiration).

1.3 SUMMARY

- A. Section includes the furnishing of all labor, materials, facilities, equipment, services, employee training, permits, agreements, waste transport and disposal necessary to perform the work required for removal of materials containing lead in accordance with these specifications, EPA, APCD, OSHA, NIOSH, State of California regulations, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.
- B. The Work includes protection and decontamination of components, fixtures, contents, and equipment remaining in the work area prior to and during lead activities, including abatement and paint stabilization.
- C. Perform the work and provide service as needed to accomplish abatement of lead containing materials at the Project Site. Specific locations and materials to be

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removed/disturbed are indicated on the Drawings. Sampling data for identification of lead containing materials is available from the District Construction Manager.

- D. Comply with all requirements of this specification for work involving any amount of lead and includes lead abatement, component removal/replacement, paint stabilization, and any other control measures to reduce lead in areas with lead-based paint, presumed-lead based paint, and paint with lead content exceeding the San Diego City Ordinance threshold requiring lead-safe work practices of 0.5 mg/cm² or 1000 ppm lead. Alternate and innovative technologies and procedures are encouraged and must be submitted in detail for approval prior to any work being performed. Any alternative technologies submitted must have been written by a Certified Industrial Hygienist (CIH) or State of California Certified Lead Project Designer or Project Monitor.
- E. In the event materials containing lead in addition to those indicated in the Drawings are discovered, do not disturb. Immediately notify the District Construction Manager who will have the additional materials tested.
- F. Related Requirements:
 - 1. Section 02 82 33 "Removal and Disposal of Asbestos Containing Materials" for asbestos abatement.
 - 2. Section 02 84 34 "Removal and Disposal of Universal Waste and PCB" for Universal Waste and PCB abatement.

1.4 ALLOWANCES

- A. Allowances for removal and disposal of materials containing lead in addition to those indicated on the Drawings are specified in Section 01 21 00 "Allowances."

1.5 DEFINITIONS

- A. All terms not defined herein shall have the meaning given in the applicable publications and regulations.
- B. "Airlock" shall refer to a system for permitting ingress or egress of personnel or equipment while minimizing movement of contaminated air between a contaminated area and an uncontaminated area.
- C. "Air Monitoring" shall refer to the process of measuring the lead content of a volume of air using NIOSH method 7082 or other method approved by the District. Flow rate and sample volume shall be in accordance with the method chosen.
- D. "Authorized Visitors" shall mean the District, a visitor authorized by the District, or any representative of a regulatory agency or other agency having jurisdiction over the project.

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- E. "Clearance Inspection" shall refer to an onsite limited investigation of single surface dust wipe sampling or soil performed by the Consultant at the completion of lead hazard reduction activities for deteriorated lead-based paint. Samples will be collected no sooner than 60 minutes after the completion of lead hazard reduction activities. Dust wipe samples will be analyzed in accordance with EPA Test Method SW-846 or other method approved by the District and/or Consultant.
- F. "Clean Room/Clean Area" shall mean an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment, and that complies with the OSHA change room standard in 29 CFR 1910.141. The clean area shall contain handwashing facilities, clean clothes, clean cloths, storage for a HEPA vacuum, and respirator storage space. Contaminated equipment or personnel shall not be permitted in this area. The floors and walls of this area shall be covered with 6-mil polyethylene sheeting.
- G. "Consultant" shall mean the consulting industrial hygienist. The Consultant is an independent party retained by the District to provide consultation services for lead-related activities.
- H. "Containment Barrier" shall refer to a system, process, or barrier surrounding and sealing the outer perimeter of the work area, consisting of walls, floors, and/or ceilings. The containment barrier is designed to ensure that lead-contaminated dust, lead-contaminated soil, or lead paint contaminants are not blown, spread, or tracked from inside to outside of a work site.
- I. "Contaminated Equipment Room" shall refer to a contaminated area or room within the decontamination enclosure system that adjoins the work area, with provisions for storage of contaminated clothing or equipment.
- J. "Decontamination Area" shall refer to an enclosed area adjacent and connected to a regulated area and consisting of an equipment room, shower area, and a clean room, that is used for the decontamination of workers, materials, and equipment contaminated with lead, without permitting lead concentrations to migrate to uncontaminated areas. See OSHA regulation at 29 CFR 1926.58).
- K. "De minimus levels" shall mean an area less than:
 - 1. Two square feet in any interior room;
 - 2. Twenty square feet on an exterior surface; or
 - 3. Ten percent of the surface area on any component part.
- L. "Deteriorated paint" shall refer to paint that is cracking, flaking, chipping, peeling, or otherwise separating from the substrate.
- M. "Disposal" shall refer to all procedures necessary to transport lead-containing or contaminated waste removed from the project site and deposit it in a waste disposal site or a conversion site in compliance with applicable regulations.

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- N. "Disposal Site" shall mean a site approved by the EPA and/or applicable State and local hazardous waste control agencies for the disposal of lead-containing wastes.
- O. "District" shall mean the San Diego Unified School District.
- P. "Disturb" or "Remove paint" shall refer to any action that creates friction, pressure, heat, or a chemical reaction upon any paint on an interior or exterior surface so as to abrade, loosen, penetrate, chip, cut through, remove, or eliminate paint from that surface. This includes all lead hazard correction activities, all demolition activities, and all surface preparation activities performed upon an interior or exterior surface containing paint.
- Q. "Doorway" shall refer to a device to allow passage of personnel or equipment from one room to another while restricting air movement between the rooms so as to minimize the dispersal of lead.
- R. "Equipment Room" or "Change Room" means a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.
- S. "HEPA Filter" shall refer to a High Efficiency Particulate Absolute filter capable of trapping and retaining 99.97% of particles with aerodynamic equivalent diameters greater than or equal to 0.3 micrometers.
- T. "HEPA Filtered or HEPA Vacuum Equipment" shall refer to equipment equipped with a HEPA filter in the exhaust outlet, and so designed and maintained that 99.97% of particles with aerodynamic equivalent diameters greater than or equal to 0.3 micrometers in the inlet air are collected and retained. All such equipment used under this contract shall be certified by manufacturers as meeting ANSI Z9.2.
- U. "HVAC system" shall refer to the heating/ventilation/air conditioning system of the building(s) within the project site.
- V. "Lead-based paint" or "lead paint" shall refer to paint or other surface coating that contains equal to or greater than 1.0 milligram per square centimeter or 0.5 percent by weight lead.
- W. "Lead-contaminated dust" shall refer to dust that contains lead equal to or greater than 10 micrograms per square foot ($\mu\text{g}/\text{ft}^2$) for interior floor surfaces, 100 $\mu\text{g}/\text{ft}^2$ for interior horizontal surfaces, and 400 $\mu\text{g}/\text{ft}^2$ for exterior floor and exterior horizontal surfaces.
- X. "Lead-contaminated soil" shall refer to bare soil containing lead equal to or greater than 400 parts per million (ppm) in children's play areas and 1000 ppm in all other areas.
- Y. "Lead hazard" shall mean:
1. The existence of deteriorated paint over a surface larger than the de minimus levels if the structure was built before 1979;

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2. The disturbance of lead-based paint or presumed lead-based paint without containment barriers;
 3. The creation or maintenance of a condition that may result in persistent and quantifiable lead exposure; or
 4. The presence of lead-contaminated dust or lead-contaminated soil.
- Z. "Limited quantity" references DOT regulations, under which 66 pounds (30 kg) or less with inner packaging up to 11 pounds (5 kg) each in strong outer packaging (49 CFR 171.8, 173.155).
- AA. "Safety Data Sheet (SDS)" shall refer to information on a product, supplied by the manufacturer, which provides the information listed by OSHA in 29 CFR 1910.1200 and 8 CCR 5194.
- BB. "mg/cm²" shall refer to milligrams per square centimeter.
- CC. "Presumed lead-based paint" shall refer to paint or surface coating affixed to a component in or on a school constructed before 1993 or other structure constructed before 1979.
- DD. "Primitive air locks" shall refer to air locks constructed using two sheets of plastic. The first one is taped on the top, the floor, and two sides of doorway. Next, a slit is cut six feet high down the middle of the plastic, not all the way to the floor. The second sheet of plastic is taped across the top of the door only, so that it acts as a flap. The flap opens into the work area.
- EE. "Project" or "Project Site" shall refer to Clairemont High School and Bell Middle School.
- FF. "Regulated Area" shall refer to an area where lead exposure can reasonably be expected to be, or where airborne concentrations of lead exceed, or can reasonably be expected to exceed, 50 µg/m³. This includes any area in which work is being performed that disturbs or removes paint and to which access is restricted to prevent migration of contaminants.
- GG. "Removal" shall refer to procedures necessary to remove lead-based paint, lead-containing/contaminated materials, and lead waste from designated areas in a safe manner, and dispose of these materials at a disposal site.
- HH. "Transport" shall refer to hauling of lead-containing wastes from a building to the disposal site and deposit of the wastes therein by a firm currently approved by the EPA for the transport of hazardous wastes and approved by any state or local agencies having jurisdiction.
- II. "µg/m³" shall refer to micrograms per cubic meter.
- JJ. "µg/ft²" shall refer to micrograms per square foot.

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- KK. "Wash room" shall refer to a room contiguous to a clean room and an equipment room in the decontamination area, equipped with one or more wash basins to adequately accommodate the workers. Provide an adequate supply of soap, shampoo, and towels.
- LL. "Wet cleaning" shall refer to the process of eliminating lead contamination from building surfaces and objects by methods that render lead adequately wet. Such methods include use of cloths and mops, or low-flow amended water sprays, or other cleaning tools that have been dampened with clean and/or amended water.
- MM. "Work Area" shall refer to an area where lead-based paint or presumed lead-based paint is disturbed or abatement is conducted.

1.6 PRE-REMOVAL MEETINGS

- A. Pre-Removal Conference: Conduct conference at Project Site.
1. The District will arrange a Pre-Removal Conference, attended by a representative of the District, the Consultant, and the Contractor.
 2. The Contractor shall identify his Supervisor and Foreman at this conference.
 3. Provide electronic copies of "Action Submittals" at least five working days prior to this conference.
 4. Pre-Removal Conference topics may include:
 - a. Contractor listing of existing site condition (e.g. damage).
 - b. Review and confirm scope of work, Hazardous Building Material Survey Reports, and material quantities.
 - c. Contractor and supporting vendor site access and parking.
 - d. Coordination of Contractor access routes to the work area, including approved doors, stairways, corridors, and elevators.
 - e. Availability of building utility services, such as power, water, and drains.
 - f. Determination of equipment and other movable items to be removed from the work area(s) by the Contractor, and the location of temporary storage space.
 - g. Location, coverage, and use of isolation barriers and decontamination facilities.
 - h. Emergency Response Procedures.

1.7 ACTION SUBMITTALS

- A. Lead Compliance Plan. The Plan shall meet the requirements of 8 CCR 1532.1 e(2)(B) and include minimally the following:
1. A description of each activity during which lead is emitted including equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices.

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2. A description of the specific means that will be employed to achieve compliance and, where engineering controls are required, engineering plans and studies used to determine methods selected for controlling exposure to lead.
3. A report of the technology considered in meeting the PEL.
4. Air monitoring data that documents the source of lead emissions.
5. A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.
6. A work practice program that includes compliance items related to protective work clothing and equipment, housekeeping, hygiene facilities, hygiene practices, and regulated areas and other relevant work practices.
7. An administrative control schedule, if applicable.
8. A description of arrangements made among contractors on multi-contractor sites with respect to informing affected employees of potential exposure to lead and of regulated areas.
9. Any other relevant information.

1.8 INFORMATIONAL SUBMITTALS

A. Pre-Removal Submittals:

1. Copies of all notifications, permits, applications, licenses and like documents required by federal, state, or local regulation in proper fashion, including CDPH form 8551, Cal-OSHA Notification, and notice to occupants if applicable. Notification shall be given to the District and Consultant at least 5 working days prior to the beginning of each phase or mobilization of work involving lead.
2. Copies of each worker's medical clearance to wear respirators.
3. Statement by the examining medical doctor that medical exams required by California-OSHA for lead work took place, and when, for each employee to be used on the project.
4. Record of successful respirator fit testing performed by a qualified individual within the previous twelve months, for each employee to be used on this project with the employee's name and fit test date, fit test method, and model and size of respirator with each record. NOTE: In the event employees are hired after the project start date, supply the proper documentation as required at least 24 hours in advance of their start.
5. Name of designated competent person(s), certificate(s) of training, and copies of "Lead-Related Construction Supervisor" certifications granted by the California Department of Public Health.
6. List of all supervisors and workers intended to be assigned to the project and copies of CDPH Lead-Related Construction Certifications granted by the California Department of Public Health.
7. Proposed Emergency Plan and route of egress from work areas in case of fire or injury, including the name and phone number of nearest medical assistance center. This shall be conspicuously posted at the work site and filed with proper agencies.
8. The name and address of Contractor's personal air monitoring and waste disposal lead testing laboratory(ies) including certification(s) of ELPAT accreditation for heavy metal analysis and National Lead Laboratory

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Accreditation Program (NLLAP) and American Industrial Hygiene Association (AIHA) accredited for lead analysis for air monitoring laboratory.

9. Safety Data Sheets (SDS) on all materials and chemicals to be used on the project.
10. Name, address, and ID number of the hazardous waste hauler, waste transfer route, and proposed disposal site.
11. Name, address, and ID number of the proposed construction debris disposal site.
12. Name, address, and ID number of hazardous waste disposal site. Documentation must be submitted from these sites proving they are licensed to accept such waste and will accept such waste.
13. A copy of the Contractor's CAL-OSHA Lead Compliance Plan, in accordance with Title 8, Section 1532.1.
14. A copy of the Contractor's CAL-OSHA Respiratory Protection Program, in accordance with Title 8, Section 5144.
15. A copy of the Contractor's CAL-OSHA Injury and Illness Prevention Program, in accordance with Title 8, Section 3203.

B. Submittals During Removal Work:

1. Remediation Progress Report.
2. Results from personal air samples.
3. Results from waste testing.
4. Results from other testing.
5. Medical, Fit Test and CDPH Lead-Related Construction Certification twenty-four (24) hours in advance of any new employees starting on the project.

C. Submittals After Removal Work:

1. Original manifests and receipts acknowledging disposal of all hazardous and non-hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.
 - a. Submit within 30 days of date that material was transported off site.

1.9 CLOSEOUT SUBMITTALS

A. Submit immediately upon completion of lead-related work:

1. All personal monitoring results.
2. All waste characterization test results.

1.10 PERFORMANCE REQUIREMENTS

A. Applicable Standards:

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1. Per California Department of Public Health, all paint on schools applied prior to January 1, 1993 is "presumed lead-based paint", and requires compliance with the most current laws and regulations including SB460 effective January 1, 2003.
2. Per CAL-OSHA and Federal OSHA, whenever construction activities disturb lead in any amount, the employer must assume that employees may be exposed to lead and comply with the requirements of the "Lead in Construction Standard" Title 8, Section 1532.1.
3. Per the City of San Diego Ordinance 19732, any person who disturbs or removes paint in the interior or exterior of a dwelling unit or structure constructed prior to January 1, 1979, or from any surface on a steel structure, shall use lead-safe work practices, unless a certified Inspector/Assessor determines, prior to the commencement of activities which disturb or remove paint, that the concentration of lead in paint is below 1,000 parts per million or 0.5 milligrams per square centimeter.

B. Contractor Personnel Qualifications:

1. All workers assigned to this project shall have been trained in accordance with California Construction Safety Orders, 1532.1, Lead-Related Construction, and shall hold "Lead-Related Construction Worker" certifications granted by the California Department of Public Health.
2. Provide one full-time onsite Supervisor whose duties shall include coordination, safety, security, and execution of all phases of the Work. The Supervisor shall not be used as a worker. The Supervisor shall hold "Lead-Related Construction Supervisor" certifications granted by California Department of Public Health.

C. Contractor Responsibilities:

1. Notifications /Approvals: In proper and timely fashion, make all applicable and necessary notifications to relevant federal, state, and local authorities and obtain and comply with the provisions of all permits or applications required by the work specified, as well as make all required submittals required under those auspices. The costs for all permits, applications, fees the like, are to be borne by the Contractor.
2. Notice to Occupants: Provide a "Notice to Occupants", meeting the requirements of the City of San Diego Lead Ordinance Section 54.1006, at least seven business days prior to any activities that disturb or remove presumed-lead based paint, lead-based paint, or paint containing greater than 1000 ppm or 0.5 mg/cm² lead. Provide notice to the District and Consultant and post at the work area.

D. Work and Scheduling Requirements:

1. Work shall be carried out in sequential phases. Inspection and approval of each phase by the Consultant shall be sought and gained before proceeding to the next phase. Work shall proceed in accordance with the schedule agreed upon by the District and approval of each phase by the Consultant shall be sought and gained prior to proceeding to the next phase. As a Contract requirement, any reasonable delay caused by this requirement shall not constitute a basis for claim against the District or Consultant.

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2. Project Sequence:

- a. Extend full cooperation to District in all matters involving the use of District's facilities. At no time shall Contractor cause or allow to be caused conditions that may cause risk or hazard to the public or conditions that might impair safe use of the facility. The use of the facility's electricity, water or like utilities by the Contractor shall be in accordance with Section 01 50 00 "Temporary Facilities and Controls."
- b. Coordinate the work of this Section with that of all other trades. Work shall not proceed in any area without the express consent of the District and Consultant. Be available within 24 hour's notice for additional work or rework if after acceptance of the work it is found that full remediation was not achieved from the initial work effort as determined by the District and Consultant.

E. Protection of Persons and Property:

1. General:

- a. Provide medical surveillance and biological monitoring on all workers in accordance with 8 CFR 1532.1.

2. Respiratory Protection:

- a. Provide workers and supervisory personnel with NIOSH approved respirators and P-100 (HEPA) filters. Respiratory protection shall be implemented for all work performed under this Section. The respirators shall be sanitized and maintained according to the manufacturer's specifications. Disposable respirators are not acceptable under any circumstances.
- b. Maintain on-site a sufficient supply of P-100 filters to allow workers and supervisory personnel to change contaminated filters per manufacturer's recommendations or when breathing resistance increases. Comply with all applicable regulations.
- c. Respirators shall be individually assigned to removal workers for their exclusive use. All respiratory protection shall be provided to workers in accordance with the respiratory protection program, which must include all items specified by CAL-OSHA Respiratory Protection Program Title 8, Section 5144, including medical clearance, fit-testing, training, cleaning, storage, inspection, and maintenance. A copy of this program shall be kept at the worksite, and shall be posted in the clean area.
- d. Additional respiratory protection using adsorbent media, such as organic vapor cartridges, may be needed when handling some coating products. If this is the case combination cartridges that are equipped with P-100 filters in series with the appropriate adsorbent media are required. Consult the Safety Data Sheets (SDS) and obtain the proper cartridges as necessary.
- e. Facial hair such as beards, long sideburns, and moustaches that interfere with the seal of air purifying type respirators are prohibited. Workers with eye corrective lenses (contact lenses or glasses) shall wear the corrective

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lenses in a manner that is in compliance with 8 CCR 1529 and 8 CCR 5144.

3. Personal Protective Equipment:

- a. Provide personal protection, in the form of disposable coveralls to all workers, supervisors, and authorized visitors entering the work area during activities disturbing lead.
- b. Provide each worker with disposable suits every day. Under no circumstances shall anyone entering the removal area be allowed to reuse a contaminated uniform. In addition to disposable suits for the workers, supply suits for the Consultant and other personnel who are authorized to inspect the worksite. Disposable suits, such as TYVEK suits, and other personal protective equipment (PPE) must be donned prior to entering work area. A clean area shall be provided for workers to put on suits and other personal protective equipment and to store their street clothes.
- c. Work clothes shall consist of disposable full-body suits, head covers, gloves with cuffs extending outside the sleeves of the protective suit, boot or shoe covers, and other protection as needed. Hard hats shall be worn, as required.
- d. Provide eye protection to personnel engaged in lead operations when the use of a full-face respirator is not required.
- e. Goggles with side shields shall be worn when working with a material that may splash or fragment, or if protective eyewear is specified on the Safety Data Sheet (SDS) for that product.
- f. All disposal protective clothing shall be discarded and disposed of as lead-contaminated waste every time the wearer exits from the workspace to the outside. All exits from the workspace will be through the decontamination facilities, except in the event of an emergency.

4. Air Monitoring:

- a. General: Perform personal air sampling during activities involving lead. The results of such sampling shall be posted, provided to individual workers, and submitted to District and/or Consultant as described herein.
- b. Sampling: Take samples for the duration of the work shift or for eight hours, whichever is less. Personal air samples need not be taken every day after the first day if working conditions remain unchanged, but must be taken every time there is a change in the removal operation, in terms of either the site or the type of work. Sampling will be used to determine eight-hour time-weighted average (TWA) exposure.
- c. Sampling Results: Transmit air sampling results to the District and/or Consultant and individual workers in written form no more than forty-eight (48) hours after the completion of a sampling cycle. The reporting document shall list each sample's sampling time and date, personnel monitored, flow rate, sample duration, analytical laboratory, analytical results, and shall include an interpretation of the results. Air sample analysis results shall be reported in micrograms/cubic meter ($\mu\text{g}/\text{m}^3$).

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- d. Testing Laboratory: The Contractor's testing lab shall be National Lead Laboratory Accreditation Program (NLLAP) and American Industrial Hygiene Association (AIHA) accredited for lead analysis.
 - e. Air Monitoring Frequency: The air monitoring frequency for Contractor operations shall be in accordance with the requirements set forth in Title 8, Section 15 32 .1.
5. Damage and Repairs to Project Site: Work activities involving lead shall be performed without damage to the building(s), including structural members, ceilings, pipes, walls, or light fixtures. Provide protection of these items and materials as part of work area preparation. Where work activities involving lead causes damage, patch, repair, replace or otherwise restore the damaged items to their original condition or replace with better materials, with no additional cost to the District. This includes repair of surfaces damaged during component removal as described herein.

1.11 QUALITY ASSURANCE

- A. District's Role: The performance and execution of the project will be monitored by the District. The District will bear costs associated with the independent laboratory and inspection work required in these Specifications for clearance testing, third party oversight, and oversight sample analyses, unless otherwise noted.
 - B. Consultant's Role: The District shall retain the services of a CDPH-certified Lead Project Monitor for the purposes of management of the work activities involving lead described herein. The Consultant will represent the District in all phases of the work activities involving lead, at the discretion of the District. Regard the Consultant's direction as authoritative and binding, as provided herein, in matters particularly involving, but not limited to, approval of work areas, review of monitoring results, completion of various segments of work, final completion of work activities involving lead, submission of data, and daily field punch list items.
1. Inspections: In addition to various daily inspections of the lead work area and work practices, the Consultant will make three mandatory inspections during the work, one during each phase of removal. Each inspection must be requested by the Contractor and be performed by the Consultant. The work being inspected must meet the Consultant's satisfaction before work may begin for the next phase of work. Failure on the part of the Contractor to obtain the Consultant's approval before proceeding to the next scheduled phase is regarded as a violation of this Section. In the event of this occurring, the Consultant will request work to be stopped and the District will be contacted to intervene. The three inspections are as follows:
- a. Work Area Preparation Completed: Have all pre-removal preparations of the work area complete, seek, and review approval from the Consultant to proceed.
 - b. Post Removal Inspection: Work shall have been completed including renovation, removal, paint stabilization, or abatement. Final clean-up of all

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visible debris final cleaning techniques of wet washing and HEPA vacuuming will have been completed.

- c. Final Clearance: The Consultant will perform final clearance wipe testing as soon as possible after final clean-up activities are completed, or as appropriate.

PART 2 - PRODUCTS

2.1 GENERAL

- A. No materials, equipment, or tools belonging to the District shall be used by the Contractor, except in case of an emergency and upon explicit authorization by the District.
- B. Deliver all materials and equipment to the site in the original containers bearing the name of the manufacturer and details for proper storage and usage.
- C. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner, which shall not interfere with operations of the District.
- D. The District and/or Consultant must approve unloading and temporary storage sites and transfer routes in advance.
- E. Damaged or deteriorated materials may not be used and must be promptly removed from the project site. Materials, that have become contaminated with lead shall be packaged as lead waste, characterized, and disposed of in an approved landfill.
- F. All materials, tools, and equipment must comply at a minimum with this specification and all applicable federal, state, and local regulations.

2.2 MATERIALS

- A. Plastic Sheeting: Sheet shall be fire-retardant polyethylene sized in lengths and widths to minimize the frequency of joints. The minimum thickness shall be 6-mils.
- B. Barrier Tape: Tape labeled as "CAUTION-LEAD HAZARD-DO NOT ENTER WORK AREA UNLESS AUTHORIZED" or similarly labeled, for use on the exteriors of the buildings.
- C. Tape: Tape shall be capable of sealing joints of adjacent sheets of plastic and of attaching plastic sheet to finished or unfinished surfaces of dissimilar materials, and shall be capable of adhering under dry and wet conditions, including wetting by amended water.

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- D. Lead Disposal Packaging: Packaging shall be suitable to receive and retain any lead-containing materials until disposal or conversion at an approved site. The packaging shall be both air and watertight.
 - 1. Bags: Disposal bags shall be double 6-mil thick polyethylene, pre-printed with labels as required by 8 CCR Section 15 32 .1.
 - 2. Labeling: Stick-on labels as per EPA, OSHA, and DOT requirement for disposal drums.
- E. Warning Signs: Signs shall be as posted to each entrance to and from the work area undergoing lead hazard reduction in accordance with Title 17 CCR 35001-36100 and 8 CCR 1532.1.
- F. Flexible duct: For ventilation units (if required).
- G. Spray adhesive: Must be fire-retardant.

2.3 TOOLS AND EQUIPMENT

- A. Airless Sprayer: Amended water and surface sealers shall be applied with an airless or other low-pressure sprayer or injector suitable for the specific application.
- B. Air Purifying Equipment: Equipment used to establish negative pressure in the work area shall be HEPA-filtered. If negative air machines will be exhausted inside any part of the building, they must be DOP tested and certified on site or have a certification of passing DOP testing attached.
- C. Vacuum Equipment: All vacuum equipment used for cleaning up shall be HEPA-filtered. Each HEPA-filtered vacuum brought onsite must be DOP tested and certified. DOP testing can be conducted on or off site, providing that each unit has a certification (of passing DOP testing) attached. At least one HEPA vacuum shall be equipped with floor (hard surface and carpet) cleaning attachments.
- D. Scaffolding/Staging/Ladders: Shall meet OSHA safety regulations, including 29 CFR 1926.450-452 and 8 CCR 1637. Where electrical power and water are used inside a work area, no electrically conductive ladders (e.g., aluminum or steel) shall be used (except for hinges and feet).
- E. Transportation Equipment: Shall be suitable for loading, temporary storage, transport, and unloading of lead-contaminated materials without exposure to persons or property. Equipment shall be currently registered with the State for transport of hazardous wastes and be currently certified by the State for vehicle inspection.
- F. Other Tools and Equipment: Furnish all equipment such as lumber, nails, ladders, hardware, and supplies that may be required to construct and dismantle the decontamination areas and the barriers that isolate the work area. Provide other suitable tools for the lead-related activities, including hand scrapers, wire brushes, sponges, mops, and shovels.

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- G. Electrical: Electrical tools and equipment shall meet all applicable codes and regulations, including, in particular, 29 CFR 1910.304, 29 CFR 1926.400-449, and 8 CCR 1760.
 - 1. Grounding. Ground fault circuit-interrupters shall always be used for all electrical equipment, except to the extent provided in an assured equipment grounding conductor program, 29 CFR 1926.404, and 8 CFR 2405.4.
 - 2. Additional requirements. Other OSHA requirements for equipment grounding conductors, beyond those described in the grounding paragraph, apply.
- H. Fire extinguishers.
- I. Portable eye washes.

PART 3 - EXECUTION

3.1 WORK AREA PREPARATION

- A. Signage: Prior to the preparation of a building for work activities involving lead, place warning signs immediately outside all entrances and exits to the building, warning that lead-related work is being conducted in the vicinity. The signs shall be in English and Spanish, at least 20 inches by 14 inches with bold lettering, and not smaller than 2 inches tall, and read: "WARNING: LEAD PAINT REMOVAL HAZARD; UNAUTHORIZED ENTRY PROHIBITED; NO SMOKING, EATING OR DRINKING ALLOWED IN THE WORK AREA.
- B. Access to the Work:
 - 1. The District will provide specific access as required during the project to the Contractor's personnel assigned to the project. Allow only authorized personnel into the work area.
 - 2. Maintain a bound logbook in which any person entering or leaving the lead work area must sign and enter the dates and times of entry and departure.
 - 3. Use of waste containers onsite shall be controlled under the following requirements:
 - a. Location of waste containers onsite shall be coordinated with the District and Consultant.
 - b. The waste containers shall be solid enclosed containers, lined with two layers of 6-mil polyethylene sheeting locked and secured at all times, when not in immediate use.
 - c. Comply with all federal, state, and local regulations and ordinances regarding lead waste storage.
 - d. Do not allow anyone access to the building unless they have successfully completed a training program and are wearing a properly fitted respirator, unless stated otherwise by the Consultant.

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- C. Containment: Establish "containment" as specified in tables 8.1, 8.2, and 8.3 of the HUD guidelines and Appendix A of the City of San Diego Lead Ordinance, as applicable. Copies of these tables are included in Appendix A of this Section.
1. Decontamination Unit: At a minimum construct a two-stage decontamination unit. This unit shall be connected to the work area (abatement or paint stabilization) for the decontamination of workers contaminated with lead. The decontamination unit shall consist of an equipment room, dirty room, and wash area in series. Ensure that employees enter and exit the work area through this unit. In addition, the decontamination unit shall be constructed with 6-mil polyethylene sheeting on floors, walls, and ceiling. Doors through this unit shall be constructed as described in Appendix A of this Section.
 2. Clean Area: Select a clean area outside the lead work area for the workers to change into protective equipment. This area shall contain hand washing facilities, clean cloths, storage for a HEPA vacuum, and respirator storage space. Contaminated equipment or personnel shall not be permitted in this area. The floors and walls of this area shall be covered with 6-mil polyethylene sheeting.
 3. Lead Work Area: Pre-clean all surfaces with a HEPA vacuum and remove any furniture, or other movable objects. All debris gathered during this clean up shall be disposed of properly. Requirements are the same for abatement or paint stabilization area(s).
 4. Deteriorated Lead-Based Paint: Clean any surfaces impacted by deteriorated lead-based paint. The cleaning of these surfaces shall be completed during establishing "containment" for the work area.
- D. Approvals and Inspections. All temporary facilities, work procedures, equipment, materials, services, and agreements must strictly adhere to and meet this Section along with EPA, OSHA, NIOSH, HUD regulations, recommendations, and guidelines, as well as any other federal, state, and local regulations. Where there exists an overlap of these regulations and guidelines, the most stringent one applies. All work performed by the Contractor is further subject to approval of the District and/or Consultant.

3.2 WORK AREA PROCEDURES

- A. In order to avoid possible exposure to dangerous levels of lead and to prevent possible contamination of areas outside the demarcated work area, work shall follow the general guidelines listed below.
1. Work Area Entry: At no time shall a worker or other authorized personnel entering the work area go further than the Clean Area without proper respiratory protection and protective clothing. Work area entry is through the decontamination area.
 2. Work Area Departure: The worker shall remove all gross contamination, debris, and dust from the disposable suit by completely HEPA vacuuming them before leaving work area. Work area exit is through the decontamination area.
 3. Personal Protective Equipment: All persons leaving the work area must remove their PPE (except respirators) before leaving. Suits shall be removed "inside out" to minimize the dispersal of lead dust.

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4. Equipment: All equipment used by the workers inside the work area shall be either left in the work area or thoroughly decontaminated before being removed from the area. Extra work clothing (in addition to the disposable suits supplied by the Contractor) shall be left in the clean area until the completion of work in that area. The clean area shall be cleaned of all visible debris and disposable materials daily.
 5. Footwear: As with additional clothing, all footwear shall be left inside the clean area until the completion of the job and then shall be HEPA vacuumed or discarded as contaminated waste.
 6. Shock hazards.
 - a. Use safe procedures to avoid electrical hazards. Power shall be shut off and checked before work begins when a hazard exists.
 - b. All extension cords and power tools used within the work area shall utilize in-line Ground Fault Circuit Interrupters (GFCI).
- B. Prohibited Practices. Under no circumstances shall workers or supervisory personnel eat, drink, smoke, chew gum, chew tobacco, or remove their respirators in the work area. To do so shall be grounds for the District and/or Consultant to stop all operations. Only in the case of life threatening emergency shall workers or supervisory personnel be allowed to remove their protective respirators while in the work area. In this situation, respirators are to be removed for as short of duration possible.

3.3 WORK ACTIVITIES INVOLVING LEAD

A. General:

1. Workmanship: All lead-related work activities shall be conducted in a professional workman-like manner. Since any lead-related work procedure may cause damage to the substrate and/or adjacent surface if performed improperly, strict work controls are required.
2. Approval: Receive prior approval from the District and Consultant before using any materials or equipment. No methods involving open flame, wire brushing, or dry scraping alone, or with the aid of flammable solvent or abrasive compound, or solvents containing methylene chloride, shall be used in removing paint.
3. Disposal: All leaded materials, residues, debris, or soil contaminated as a result of lead-related work, must be treated, and/or disposed of in accordance with regulations and guidelines of EPA, HUD, state and local regulations and ordinances, and all other applicable agencies.
 - a. All such materials shall be wrapped in 6-mil plastic sheeting with all edges and seams sealed or placed in 6-mil plastic bags with the top of the bags twisted so as to form a loop. The loop shall then be sealed. The bags of residue/debris shall then be further containerized in an additional 6-mil plastic bag.
 - b. The sealing process shall include the use of a waterproof tape of sufficient strength so as to maintain the integrity of the seal.

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- c. All components shall have all nails and/or other hardware flattened or removed prior to disposal.
 - d. The residue/debris shall be lightly misted prior to placement for disposal.
 - e. The residue/debris shall be carefully handled so as to prevent rupture, or in any way diminishing container integrity.
 - f. All wastewater shall be collected and tested prior to disposal. Consider filtering the water through a 5-micron filter prior to testing.
- 4. Damage and Repairs to Project Site: Work activities involving lead shall be performed without damage to the building(s), including structural members, ceilings, pipes, walls, or light fixtures. Provide protection of these items and materials as part of work area preparation. Where work activities involving lead causes damage, patch, repair, replace or otherwise restore the damaged items to their original condition or replace with better materials, with no additional cost to the District. This includes repair of surfaces damaged during component removal as described herein.
 - 5. Responsibilities and Supervision: Use approved lead-related work practices during the course of the work. Abide by all of the worker protection and safety specifications as outlined. Provide electrical service sufficient for the equipment to be used during lead-related work. Provide plumbing so that adequate services are available for washing down the areas after lead-related work and for personal hygiene. Provide an on-site lead abatement Supervisor/Competent Person during all phases of work activities involving lead.
- B. Component Removal Procedures: All bundles of "containers" of removed components and/or debris shall be carefully handled to reduce the potential of ripping, bursting, or otherwise diminishing the integrity of the bundle or "container".
- 1. Care shall be taken so that leaded materials are neither burned, made to become dusty, nor result in further exposure to workers, occupants, children or observers.
 - 2. Care shall be taken to avoid damage to adjacent areas during the removal of components to be replaced. Run a utility knife around the edge (score) of the component substrate and the adjacent (non-abated) substrate to cut any bonding between the substrates and thereby eliminate damage.
 - 3. If components to be removed contain gross areas of loose or peeling paint, these areas shall be wet scraped or HEPA vacuum prior to removal. The paint chips shall be contained either in the HEPA vacuum or in a separate 6-mil polyethylene bag. Temporary encapsulant expressly for this purpose is also acceptable.
 - 4. Components that are removed for replacement shall be wrapped and stored for disposal, or disposed of in accordance with the applicable codes and requirements of this Section.
 - 5. Wood Component Removal: A pry device shall be utilized to carefully remove the components. Once the component has been removed, the resulting material shall be cut into lengths that are easily managed for the purposes of containerization. Containerization shall be accomplished by removing or flattening all nails to prevent punctures or tearing and wrapping the material in six-mil plastic sheeting. The wrapping shall be finalized by securing with waterproof tape of sufficient strength at all edges and seams, so as to prevent diminishing the integrity of the container.

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C. Paint Film Stabilization.

1. Substrate Repairs:
 - a. Prior to stabilizing lead-based paint, correct substrate surfaces defects. Remove loose, unsound, or deteriorated substrates.
 - b. Place in 6-mil polyethylene disposal bag and dispose of in accordance with applicable regulations.
2. Paint Removal.
 - a. Wet Scraping: Remove all loose, flaking, and deteriorated paint by wet scraping. Continually mist surface with water during scraping. Clean any generated debris by HEPA-vacuum.
 - b. Wet Sanding: Prepare finish surfaces by wet sanding, feathered edges lightly. Keep surface wet while sanding. Use hand sanding and HEPA-vacuum debris. If mechanical sanders are used they must be equipped with integrated HEPA-filtered dust collection.
3. Surface Cleaning.
 - a. Dust and chips: HEPA vacuum surface after drying.
 - b. Chemically treat surface if necessary for good paint adhesion. Follow manufacturer's printed instructions for system used.
 - c. Test surface for pH following chemical treatment.

D. Demolition of Materials Containing Lead:

1. Exclusion Zone: At a minimum, an exclusion zone of 20 feet shall be established around the work area prior to commencement of demolition activities.
2. Worker Safety: During demolition activities, only workers certified under the CDPH LRC program shall be allowed within the exclusion zone, including machinery operators and supporting workers. Workers shall also don Level C PPE, as outlined by OSHA and specifically consisting of respirators equipped with P-100 HEPA filter cartridges, coveralls, hardhats, work gloves, and appropriate footwear.
3. Public Safety and Perimeter Monitoring: To ensure public safety, the Contractor's Supervisor/Competent Person shall not be within the exclusion zone and shall instead be responsible for maintaining the integrity of the exclusion zone (i.e., keeping members of the public and any other trades onsite out of the exclusion zone). The Consultant shall perform perimeter monitoring of demolition activities at a frequency adequate to establish work is being performed in an appropriate and safe manner.
4. Demolition Activities: Demolition shall be completed using adequate amounts of water (i.e., "wet methods") to control the release of lead dust.

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5. Waste Storage and Characterization: Following demolition, waste shall be stockpiled, either on hardscape (i.e., concrete or asphalt) or on a poly drop sheet, and covered while characterization of the waste stream occurs. The Contractor shall be responsible for sampling and characterization of waste generated during demolition activities.
6. Disposal: Disposal shall meet standards specified above.

3.4 CLEANING AND FINAL CLEARANCE

- A. End of Day Cleaning: Thirty (30) minutes prior to the end of each workday, the lead work area must be cleaned of all debris. Under no circumstances will lead clean-up be permitted when active LBP removal work, lead paint stabilization, or other work involving disturbance of lead paint, presumed-lead based paint, or paint exceeding the City of San Diego threshold requiring lead-safe work practices is proceeding. All interior surfaces in the work area shall be cleaned of dust and debris. Such cleaning shall include a thorough HEPA vacuuming of all affected surfaces, as determined by the Consultant. Additionally, such cleanings may require the use of a lead-specific cleaner. All waste materials generated during this daily clean up shall be disposed of as hazardous waste, unless analytical testing proves otherwise.
- B. Equipment Cleaning: Durable equipment, such as power and hand tools, generators, and vehicles shall be cleaned prior to removal from unit undergoing lead paint removal or paint stabilization or the site. All equipment shall be cleaned by HEPA vacuuming and wet washing with a lead-specific cleaner.
- C. High Efficiency Particulate Air (HEPA) Vacuum: Obtain HEPA vacuum attachments, such as various size brushes, crevice tools, and angular tools to be used for varied applications and service the HEPA vacuum routinely to assure proper operation. Caution shall be used any time the HEPA vacuum is opened for filter replacement or debris removal. Operators shall wear a full set of protective clothing and equipment, including respirators, when using the HEPA vacuuming equipment or removing/replacing used filters.
- D. Preliminary Cleanup: Upon completion of the abatement, stabilization, or interim control and a satisfactory visual inspection by the District and/or Consultant in a given work area, perform a preliminary clean-up. This clean-up includes removal of any contaminated material, equipment, or debris including polyethylene sheeting from the work area. The polyethylene sheeting shall first be sprayed or misted with water for dust control, the resulting debris removed, and then the sheeting shall be folded in upon itself.
 1. Large Debris: Large debris from work activities involving lead shall be wrapped in polyethylene sheeting at least 6-mil thick, sealed with heavy-duty duct tape, and stored until proper disposal.
 2. Small Debris: Prior to picking up or collecting small debris, the surfaces of this debris will be sprayed with a fine mist of water. The debris will be picked up, collected, and placed into a single plastic bag, at least 6-mil thick. The bags shall

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- not be overloaded, shall be securely sealed, and shall be stored in the designated area until disposal. Dry sweeping is not permitted in the work area; wet sweeping is required.
3. Plastic Sheetting: Removal of surfaces 6-mil polyethylene sheeting shall begin from upper levels. Removal of ground polyethylene sheeting shall begin at the corners and folded into the middle to contain the dust or residue. All collected polyethylene sheeting shall be placed in 6-mil polyethylene bags for proper disposal as described in these Specifications.
 4. HEPA Vacuum: Once the 6-mil polyethylene sheeting is removed from the work area, cleaning shall begin with a thorough HEPA vacuuming of all surfaces, starting at the ceilings, proceeding down the walls and including window, door, and door trim and floor. The floor shall be vacuumed last, beginning at the farthest corners from the entrance to the work area. HEPA vacuuming shall again be performed as noted above, after the following wet wash.
 5. Wet Wash: Next, wet wash or mop the same surfaces with a lead-specific cleaner and allow surfaces to dry. Then a second HEPA vacuuming of the surfaces will be performed by the contractor, as described above. By the conclusion of the cleaning phase, all visible dust and debris shall have been completely removed.
 6. Hygiene, Cleaning Equipment and Supplies. Special attention shall be given to personal hygiene and the cleaning of supplies and equipment. All mop heads; sponges and rags shall be replaced or changed daily, at a minimum. Rags, mop heads or sponges may be reused if the Contractor has them cleaned via a washing system specially equipped with HEPA filtration.
 7. Detergents: Prepare and use detergents specifically designed for lead abatement work. The manufacturer's recommended coverage will be followed. Detergent solutions should be replaced as needed.
 8. Wastewater. The wastewater from the clean-up shall be contained and disposed of according to all applicable federal, state, county, and local regulations and guidelines. In no instance shall wastewater be disposed in storm sewers (e.g., yard inlet or street drain) or sanitary sewers (e.g., toilet, sink, or any other household/ residential/ commercial type drain system) without specific governmental approval.
- E. Visual Inspection: Request a visual inspection by the Consultant. If the area does not pass a visual inspection, re-clean the area.
- F. Work Area Clearance: When all surfaces have passed visual inspection, wipe samples shall be performed by the Consultant. This shall be performed after completion of the final clean up. The standards for passing a wipe test are outlined herein. Should laboratory results indicate that the wipe test clearance level is exceeded, re-clean the affected area, at no additional cost to the District, utilizing the methods specified above. Re-testing will then be performed to verify compliance with the mandated levels. Pay for all additional testing and provide, at no additional cost, a re-cleaning of an affected area until the clearance level is achieved. Bear any additional expenses, such as relocation expenses and Consultant fees, due to failure of clearance testing.

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- G. **Finish Coatings.** Finished coatings, including stains, primer, sealers, and poly coatings, if used, shall only be applied upon approval by the District and/or Consultant. Any surface requiring painting shall be primed with an approved primer.
- H. **Final Clearance.** Final clearance shall take place after finish coating has been applied. Final clearance shall include visual inspection and wipe sampling as per Section 3.4 (I) and (J).
- I. **Inspection/Clearance Standards.** When clean-up has been completed and all surfaces have been sealed, wipe samples by the Consultant will be performed. The following standards shall be met for all "clearance" requirements.

Type of Procedure	Number and Location of Wipe Samples
Interior Treatments	<p>Two wipe samples from every treated room (up to four rooms) as follows:</p> <ul style="list-style-type: none"> One interior window sill or window trough, alternating between rooms (one floor if window not present) One floor
Exterior Treatments	<p>Two wipe samples as follows:</p> <ul style="list-style-type: none"> At least one dust sample on a horizontal surface in part of the outdoor living area One window trough sample on each floor where exterior work was performed
<p>Notes:</p> <p>(1) An area is a room, closet, pantry, hall, portion of room (such as the dining area of a kitchen/dining room), etc. If a room and its closet are both abated, they can be treated as one area for purpose of wipe testing.</p> <p>(2) Other applicable areas may also have wipe samples taken, at the discretion of the Consultant in conformance with the HUD Guidelines for the Evaluation and Control of LBP Hazards in Housing.</p>	

- J. **Wipe Standards.** The standards for passing a wipe test are:
- Floors. 10 micrograms per square foot or less.
 - Interior window sills/surfaces. 100 micrograms per square foot or less.
 - Exterior horizontal window and floors. 400 micrograms per square foot or less.
- K. **Retests:** Should laboratory results indicate that the wipe test clearance level is exceeded, re-clean the affected area, at no additional cost to the District, utilizing the methods specified above. Retesting will then be performed to verify compliance with the mandated levels. Pay for all additional testing and Consultant fees, and provide at no additional cost a re-cleaning of an affected area until the clearance level is achieved.

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3.5 DISPOSAL OF WASTE MATERIALS

- A. All materials, whether hazardous or non-hazardous, shall be disposed in accordance with all laws and the provisions of this Section and all applicable federal, state, county or local regulations and guidelines. Assure compliance with all laws and regulations relating to this disposal.
- B. General Applicability.
 - 1. Contact the regional EPA, state, and local authorities to determine lead-containing or contaminated debris disposal requirements.
 - 2. The requirements of Resource Conservation and Recovery Act (RCRA) shall be complied with as well as California solid waste plan requirements. During lead-related work, do not leave debris on the property, incinerate debris, dump waste by the road or in an un-authorized dumpster, or introduce lead contaminated water into storm or sanitary sewers.
- C. Disposal Requirements.
 - 1. Dispose of the following materials as hazardous waste in accordance with this Section:
 - a. All paint chips and paint chip debris.
 - b. Lead-containing or contaminated materials exceeding regulatory thresholds.
 - 2. Test the following materials individually and provide results to District and Consultant, to determine whether they are to be considered hazardous.
 - a. Wastewater used to decontaminate.
 - b. Rags, sponges, mops, HEPA filters, respirator cartridges, and other materials used for lead-related work and clean-up and containment.
 - c. Other waste derived from work activities involving lead.
- D. Hazardous Waste Tests.
 - 1. Perform the Toxicity Characteristic Leaching Procedure (TCLP) to determine whether the wastes are classified as non-hazardous solid or hazardous waste as defined under RCRA. Representative samples shall be required of all material to be disposed.
 - 2. If any of these samples are above the TCLP regulatory limits, dispose of all of that type of material as hazardous waste.
 - a. Meet the requirements of the State of California, as per Title 22, CCR 66261 and other related regulations. This will include, if applicable, other waste testing, such as Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC).
 - b. Submit written manifest to District prior to removing any waste from the site and submit a complete manifest to District after waste is disposed of. The

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following documents are made applicable and part of this Section: 40 CFR 241, 257, 261, 262, and 49 CFR 172, 173, 178, and 179, Department of Transportation (DOT) Regulations.

- E. Disposal of Non-Hazardous Contaminated Solid Waste: The following procedures shall be followed for the disposal of all non-hazardous materials:
1. Place all non-hazardous contaminated materials in 6-mil polyethylene bags that are airtight and puncture resistant. Pieces of wood or other types of substrates that do not fit into plastic bags shall be wrapped and labeled "DANGER, LEAD DUST."
 2. Place all disposable cleaning materials, such as sponges, mop heads, filters, disposable clothing in 6 mil plastic bags and seal.
 3. Clean surfaces, equipment, and bag large debris. Remove plastic sheeting and tape from covered surfaces. Prior to removing the plastic sheeting, lightly mist the sheeting in order to keep dust down and fold inward to form tight bundles to bag for disposal. Place all plastic sheeting in 6-mil thick plastic bags and seal. Any bags shall be labeled "Danger, Lead Dust."
 4. Bag and seal vacuum bags and filters in 6-mil thick plastic bags.
 5. Place all contaminated clothing or work area clothing used during lead-related work, in 6-mil thick plastic bags for disposal prior to leaving the work area.
 6. Contain and properly dispose of all liquid waste, including lead dust-contaminated wastewater.
 7. HEPA vacuum the exterior of all liquid waste containers, prior to removing the waste containers from the work area, and wet wipe the containers to ensure that there is no residual contamination. Containers shall then be moved out of the work area into the designated storage area.
 8. Ensure that all waste is transported in covered vehicles to a landfill, or lined landfill, if available, in accordance with applicable DOT and EPA Regulations.
 9. Submit to the District and/or Consultant for approval, the waste transfer procedure, and route, and shall comply with all EPA and DOT regulations concerning hazardous and non-hazardous waste removal and transportation.
- F. Disposal of Hazardous Waste: The following procedures shall be followed for disposal of all material as hazardous waste:
1. Comply with the RCRA and with all applicable state and local regulations.
 2. Comply with all EPA regulations.
 3. Prepare for disposal as follows:
 - a. Packaged and sealed in containers approved under 49 CFR 173, 178, and 199.
 - b. Containers shall be numbered to correspond to the seal number, labeled with the type of materials, date it was filled and sealed, seal number, and weight of sealed container in addition to the information required under 49 CFR 172.
 - c. A log shall be prepared at time of filling, identifying each numbered container and the information from above. A copy of this log shall be turned

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- over to the Consultant within three working days after the containers are filled.
- d. Name, location, and telephone number of the disposal site used. A copy of the sites state and locally issued license, and a signed agreement that they will accept the hazardous lead waste, shall be provided to the Consultant.
 - e. Name, address, and telephone number of any waste subcontractors used. Provide copies of licenses and signed agreements to the Consultant.
 - f. Submit copies of the Hazardous Waste Manifest as required herein.
- 4. Waste Transportation: All Hazardous Waste shall be transported by a certified hazardous waste transporter. Require the certified hazardous waste transporter to follow RCRA and DOT regulations.
 - 5. Prior to the removal of any hazardous waste, the below listed information must be received in writing by the District and Consultant for their review and approval. Once approval is received from the District and Consultant, the waste may be transported as required.
 - a. Quantity of hazardous waste.
 - b. Type of waste materials.
 - c. Method of containerizing waste or waste treatment and appropriate licensing, certification and regulatory approvals.
 - d. Proposed waste hauler and disposal route.
 - e. Proposed waste disposal site or landfill.
 - 6. Receipts from the waste hauler and waste disposal site or landfill must be received and approved by District and Consultant per regulation.
- G. Storage Requirements: Any item found to be hazardous, by way of testing, shall be kept in a secured area or lockable and DOT approved container that is inaccessible to all persons other than lead-related work personnel. All hazardous waste shall be labeled "Hazardous Waste" and a date that the Contractor began to collect waste in that container. All hazardous and non-hazardous waste shall be kept in totally and completely separate containers. Until TCLP testing proves an item to be non-hazardous, all items shall be considered hazardous and stored in a secured area or lockable container.
- H. Regulations: Comply with the RCRA and/or any other applicable federal, state, or county law, regulation and/or guidelines, whichever is most stringent.
- I. Emergency Procedures: Keep and properly maintain a suitable fire extinguisher(s) on site; have an immediate means of communication with a regulatory agency in the event of an emergency; keep a list of phone numbers of regulatory agencies on site, make sure all employees know how to deal with all types of accidents, make one person who is always on site the emergency coordinator to ensure that emergency procedures are carried out in the event an emergency arises; and keep and maintain a "right to know" manual that is in an easily accessible location and in an area that is known to all employees.

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APPENDIX A

WORKSITE PREPARATION

Table 8.1 – Interior Worksite Preparation Levels (not including windows)

Description	Level 1	Level 2	Level 3	Level 4
Typical Applications (Hazard Controls)	Dust removal and any abatement or interim control method disturbing no more than 2 square feet of painted surface per room.	Any interim control or abatement method disturbing between 2 and 10 square feet of painted surface per room.	Same as Level 2.	Any interim control or abatement method disturbing more than 10 square feet per room.
Time Limit Per Building	One workday.	One workday.	Five workdays.	None.
Occupant Location	Inside building, but outside work area. Occupant must have lead-safe passage to bathroom, at least one living area, and entry/egress pathways. Alternatively, occupant can leave the dwelling during the workday.	Same as Level 1.	Outside the building; but can return in evening after day's work and cleanup are completed. Occupant must have safe passage to bathroom, at least one living area, and entry/egress pathways upon return. Alternatively, occupant can leave until all work is completed.	Outside the building for duration of project; cannot return until clearance has been achieved.
Containment and Barrier System	Single layer of plastic sheeting on floor extending 5 feet beyond the perimeter of the treated area in all directions. No plastic sheeting on doorways is required, but a low physical barrier (furniture, wood planking) to prevent inadvertent access is recommended. Children should not have access to	Two layers of plastic on entire floor. Plastic sheet with primitive airlock flap on all doorways. Doors secured from inside the work area need not be sealed. Children should not have access to plastic sheeting (suffocation hazard).	Two layers of plastic on entire floor. Plastic sheet with primitive airlock flap on all doorways to work areas. Doors secured from inside the work area need not be sealed. Overnight barrier should be locked or firmly secured. Children should not have access to plastic	Two layers of plastic on entire floor. If entire unit is being treated, cleaned, and cleared, individual room doorways need not be sealed. If only a few rooms are being treated, seal all doorways with primitive airlock flap to avoid cleaning entire unit. Doors

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Table 8.1 – Interior Worksite Preparation Levels (not including windows)

Description	Level 1	Level 2	Level 3	Level 4
	plastic sheeting (suffocation hazard).		sheeting (suffocation hazard).	secured from inside the work area need not be sealed. Children should not have access to plastic sheeting (suffocation hazard).
Warning Signs	Required at entry to room but not on building (unless exterior work is also under way).	Same as Level 1.	Posted at main and secondary entryways.	Posted at building exterior near main and secondary entryways.
Ventilation System	Building ventilation system turned off, but vents need not be sealed with plastic if they are more than 5 feet away from the surface being treated. Negative pressure zones (with negative air machines) are not required, unless large supplies of fresh air must be admitted into the work area to control exposures to other hazardous substances (for example, solvent vapors).	Turned off and all vents in room sealed with plastic. Negative pressure zones (with negative air machines) are not required, unless large supplies of fresh air must be admitted into the work area to control exposure to other hazardous substances (for example, solvent vapors.)	Same as Level 2.	Same as Level 2.
Furniture	Left in place uncovered if furniture is more than 5 feet from working surface. If within 5 feet, furniture should be sealed with a single layer of plastic or moved for paint treatment. No covering is required for dust removal.	Removed from work area. Large items that cannot be moved can be sealed with a single layer of plastic sheeting and left in work area.	Same as Level 2.	Same as Level 2

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Table 8.1 – Interior Worksite Preparation Levels (not including windows)

Description	Level 1	Level 2	Level 3	Level 4
Cleanup (See Section 3.4 for further details)	HEPA vacuum, wet wash and HEPA vacuum all surfaces and floors extending 5 feet in all directions from the treated surface. For dust removal work alone, a HEPA vacuum and wet wash cycle is adequate (i.e. no second pass with a HEPA vacuum). Also wet wash and HEPA vacuum floor in adjacent area(s) used as pathways to work area. Do not store debris inside building overnight; transfer to a locked secure area at the end of each day.	HEPA vacuum, wet wash and HEPA vacuum <i>all</i> surfaces in room. In addition, wet wash and HEPA vacuum floor in adjacent area(s) used as pathway to work area. Do not store debris inside building overnight; use a secure locked area.	Remove top layer or plastic from floor and discard. Keep bottom layer of plastic on floor for use on the next day. HEPA vacuum, wet wash and HEPA vacuum <i>all</i> surfaces in room. In addition, wet wash and HEPA vacuum floor in adjacent area(s) used as pathway to work area. Do not store debris inside building overnight; use a secure locked area.	Full HEPA vacuum, wet wash and HEPA vacuum cycle
Clearance Inspection/Dust Sampling	Visual clearance only.	If lead-based paint or presumed lead-based paint clearance inspection with single surface dust sampling	If lead-based paint or presumed lead-based paint clearance inspection with single surface dust sampling	If lead-based paint or presumed lead-based paint clearance inspection with single surface dust sampling

Note: Floor sanding and abrasive blasting on lead-based paint or presumed lead-based paint are not included in Table 8.1. Worksite preparation requirements are more stringent and area preparation must be approved by Consultant or District prior to beginning work.

END OF SECTION 02 83 33

SECTION 02 84 34**REMOVAL AND DISPOSAL OF UNIVERSAL WASTE AND PCB****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.
- B. Hazardous Building Materials Survey Reports, prepared by the District's Consultant, are available from the District Construction Manager.

1.2 REFERENCE DOCUMENTS

- A. The current issue of the following documents are incorporated herein and shall govern the conduct of the Work. Where conflict among requirements or with this specification exists, the more stringent requirements shall apply.
- B. Code of Federal Regulations (CFR):
 - 1. 29 CFR 1910.134, Respiratory Protection.
 - 2. 40 CFR 273, Standards for Universal Waste Management.
 - 3. 49 CFR Parts 101, 106, 107, 171 to 180, The Transportation Safety Act, Hazardous Material Transportation Act.
- C. California Code of Regulations (CCR):
 - 1. Title 8, Division 1, Chapter 4, Construction Safety Orders.
 - 2. Title 8, Section 5144 Respiratory Protective Equipment.
 - 3. Title 22, Division 4.5, Hazardous Waste Management.
- D. State and Local Regulations: California Health and Safety Code, Division 20.

1.3 SUMMARY

- A. Section includes the abatement of potential hazards relating to materials falling under the RCRA Universal Waste Rule (UWR), materials potentially containing polychlorinated biphenyls (PCB), and UWR/PCB contaminated materials.
- B. Perform the work and provide service as needed to accomplish removal, containment, transport, and disposal of UWR/PCB containing/contaminated materials. Furnish all labor, materials, equipment, services, insurance (specifically covering the handling of

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UWR/PCB waste), decontamination facilities, waste characterization testing services, and disposal of all UWR/PCB containing/contaminated materials, including:

1. Removal and disposal/recycling of potentially mercury-containing fluorescent light tubes from light fixtures and other non-incandescent light bulbs.
2. Removal and disposal/recycling of potentially mercury-containing switches from thermostats.
3. Removal and disposal/recycling of potentially tritium-containing exit signs.
4. Removal and disposal/recycling of potentially Freon™-containing air conditioning units and refrigeration systems.
5. Removal and disposal/recycling of lead/acid batteries.
6. Removal of all potentially PCB-containing ballasts from light fixtures. All light fixtures shall be visually inspected prior to removal or retrofitting to determine if they contain PCBs. Those ballasts marked as "No PCBs" or "PCB Free" shall be considered as such. Those ballasts that are unmarked shall be considered PCB containing and properly handled.
7. Proper cleanup and disposal of light fixtures if ballast oils have breached its container.
8. Removal and disposal/recycling of any building material falling under the Universal Waste Rule as indicated on the Drawings or as directed in writing by the District.
9. Placement of all contaminated items generated as a result of work activities and clean up in approved storage containers.
10. Proper packaging of all PCB or PCB-contaminated items including the use of an approved absorbent to contain any leaks that may occur during transportation to the disposal facility.
11. Marking and labeling of all UWR/PCB materials and items for storage and disposal/recycling purposes.
12. Transport of all UWR/PCB items, and containers to a disposal facility and/or to an approved off-site processing site for recycling.
13. Waste characterization of all building materials removed from the site.
14. Recordkeeping in accordance with all applicable local, state, and federal regulations.
15. Preparing manifests, bills of lading, and all other required documentation for transportation, processing, and disposal of UWR/PCB for signature by the District.

C. Related Requirements:

1. Section 02 82 33 "Removal and Disposal of Asbestos Containing Materials" for asbestos abatement.
2. Section 02 83 33 "Removal and Disposal of Materials Containing Lead" for lead abatement.

1.4 ALLOWANCES

- A. Allowances for removal and disposal of UWR/PCB items are specified in Section 01 21 00 "Allowances."

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1.5 ACTION SUBMITTALS

- A. Product Data: For absorbent, solvent, and/or cleaning agent.

1.6 INFORMATION SUBMITTALS

- A. Site Specific Work Plan describing procedures, products and materials for the containment of the regulated work area (where appropriate), removal of UWR and PCB-containing/contaminated liquids and solids, decontamination of equipment and disposal of equipment that contained UWR and PCBs, waste storage containers, spill clean-up, personnel decontamination, emergency contact numbers and procedures, first aid treatment, and temporary on-site storage procedures. This work plan shall include the names and daytime phone numbers of all key personnel, the location of all required on-site documentation and emergency equipment, and delineation of the work area. A generalized, "boiler-plate" type of plan will not be accepted. The Plan shall include minimally the following:
1. Overall Statement: Overall statement of procedures proposed for use in complying with the regulations and requirements included in this specification.
 2. Quality Assurance Program: A description of the program, to include at a minimum:
 - a. Control Measures: Measures to assure control of unsafe or unhealthy conditions; prevent spills or leaks, damage to the building or its furnishings; avoid buildup of UWR/PCB containing/contaminated materials; and ensure reliability of sampling and analysis.
 - b. Cleanup: Waste cleanup procedures and disposal plan, including on-site waste packaging method (e.g., scooping and bagging, vacuum hose transfer with small (or large) bagging, etc.); name and description of any on-site waste transfer equipment, including evidence of training and experience in its use, and description of decontamination unit around any such equipment to be located outside the work area; name and location of disposal site(s), each having an EPA Identification Number as a hazardous waste disposal site; and copies of applicable Identification Numbers, certificates and registrations for hazardous waste transporter(s), transferer(s), treater(s) and disposal site(s), and converter(s).
 - c. Pollution Control: Detailed description of the methods to be employed to control pollution and minimize generation of hazardous and non-hazardous waste.
 - d. Protection of occupants and visitors. Methods to be used to assure the safety and health of building occupants and visitors at the site from the effects of the work.
 3. Emergency Preparedness:
 - a. Emergency Procedures: Procedures to be followed in the event of critical circumstances, including fire, electric shock, life-threatening -bodily injury inside or outside of the containment area, a major breach in the

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- containment barrier, the detection of airborne contamination or debris outside of the containment area, splitting or spilling of waste containers en route to a waste vehicle.
- b. Emergency Contact Information: Contact information, including a list of names and telephone numbers (with area codes) of the Contractor's contact persons, the District, or other contact persons as designated by the District, the fire department, police department, general emergency number (if used), and local hospital or similar emergency care unit available at all times work is to be performed. A copy of this emergency contact information is to be kept at the job site, available for inspection by the District and/or an Authorized Visitor, and updated as required.
 - c. Contingency Plan: A plan that addresses procedures to be followed should work area containment be breached, a release of hazardous materials occur, visual inspection or air monitoring clearance criteria for a work area not be met in a timely manner, etc.
4. Materials:
- a. List of materials to be used, including such items as protective clothing, respiratory protection, absorbents, solvents, waste storage containers, item containers, and all appurtenances.
5. Safety Data Sheets (SDS):
- a. Safety Data Sheets for any materials to be brought to the site for which SDS's are provided by the manufacturers or distributors. For items for which an SDS is not available, submit the name of the manufacturer, brand name, and catalog/part number for each item.
6. Performance: A statement describing the proposed organization of the work, including:
- a. Sequencing of work.
 - b. Shifts: Length and projected times of day of work shifts.
 - c. Interfacing: Interface of trades involved in the work.
 - d. Special procedures: A detailed description of any proposed methods of special abatement procedures, where used. Submit manufacturer's technical specifications and product description literature for the methods and equipment used.
7. Protective Equipment: A Protective Equipment (PPE) Program including a Respiratory Protection Program, to include:
- a. Equipment: A list of all equipment, tools, and materials available for use on this project.
 - b. Medical Surveillance: A description of the Contractor's medical surveillance program for persons under the supervisory control of the Contractor who may be occupationally exposed to hazardous substances

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under this contract. Minimal qualifications shall be as specified in 29 CFR 1910.134 and 8 CCR 5144.

- B. Qualification Data: For abatement contractor and waste hauler.
- C. Copy of waste hauler license.
- D. Contractor's USEPA identification number.
- E. Disposal Manifests:
 - 1. Original manifests and receipts acknowledging disposal of all hazardous and non-hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.
 - a. Submit within 30 days of date that material was transported off site.

1.7 CLOSEOUT SUBMITTALS

- A. Submit immediately upon completion of abatement work:
 - 1. Compliance certificate verifying that all UWR/PCB wastes have been properly treated and disposed of.
 - 2. Original manifests, permits, or other documents currently in effect relating to the specific UWR/PCB wastes transported, treated, and disposed of, except as otherwise stated in this Section.
 - a. Submit within 30 days of date that material was transported off site.
 - 3. A copy of all final manifests. (As the waste generator, the District will sign the complete waste manifests, upon approval, for all UWR/PCB items/wastes generated during the course of this project. These manifests will accompany the waste loads to disposal and be properly completed by the hauler and disposal agent, as required under federal and state hazardous waste management statutes. Return the final manifest to the District by registered mail within the designated time period under federal statutes.)
 - 4. Certifications of incineration (for fluids) and/or recycling.
 - 5. Records and storage data to include:
 - a. Name of the firm performing the work of this section and technician in charge.
 - b. Number and size of drums and other storage containers.
 - c. Weight in kilograms or gallons of content for each drum or other storage container.
 - d. Date placed in storage.

1.8 PERFORMANCE REQUIREMENTS

A. Project Supervision:

1. Provide English-speaking on-site Supervisor who is experienced, trained, knowledgeable, and qualified in the techniques of UWR/PCB abatement, handling of UWR/PCB waste and UWR/PCB-contaminated materials, and cleaning of UWR/PCB-contaminated areas.

B. Protection of Persons and Property:**1. General Safety Requirements:**

- a. Initiate, maintain, and supervise all safety precautions and programs in connection with the Work.
- b. Take all precautions and measures required to protect employees, inspection personnel, the District, the District's Representative, and the public from exposure to UWR/PCB solids, liquids, and vapors.
- c. All personnel authorized for entry into the work areas shall be instructed in the proper procedures for working with or around electrical hazards and UWR/PCB containing/contaminated materials.
- d. All electrical equipment, upon which UWR/PCB-related activities are to be performed, shall be de-energized, locked out/tagged out, and permanently disconnected from any power source prior to the commencement of work.
- e. Consumption of food or tobacco products shall not be permitted in any of the work areas where UWR/PCB materials, volatile solvents, or other hazardous materials are present. In addition, no open flames shall be permitted in these areas. Signage to this effect shall be posted at each entry and exit from the work areas.

C. Work Area Protection and Demarcation:

1. Prior to commencing any UWR/PCB-related work activities, provide barricades, roping, and warning signs to clearly identify and effectively guard against unauthorized entry into the work area.
 - a. At a minimum, barricades shall consist of yellow sawhorses, set end-to-end.
 - b. Ropes are to be yellow in color and supported by the use of weighted bottom pipe type supports.
 - c. Warning signs shall be suspended from the rope and placed at intervals of approximately 10 feet. Warning signs for the work area shall be approximately 18 inches square, with a yellow background and black lettering. Signs shall read "DANGER - KEEP OUT - TOXIC CHEMICAL WORK AREA."
 - d. Place barricades in order to maintain a minimum of 25 feet from all perimeters of the work being conducted to the barricades, where feasible.
2. Confine all equipment, such as tools and containers, to the work area until the work is complete, containers are sealed, and equipment has been properly decontaminated and safely stored for transport.

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D. Personal Protective Clothing, Equipment, and Personal Protective Procedures:

1. At all, times when UWR/PCB fluids or mixtures in any volume are not sealed in drums, containers, or electrical equipment, workers shall wear the following:
 - a. Gloves impermeable to both UWR/PCB and the clean-up agent in use.
 - b. Disposable coverall, impermeable to both UWR/PCB and the clean-up agent in use.
 - c. Appropriate eye protection to ensure that eyes are protected from liquid splatter or exposure to concentrated vapors or fumes.
 - d. If appropriate, respiratory protection appropriate for the concentration of the hazardous material(s) present and atmosphere present. If utilized, supplied air must meet the requirements for Grade D air, at a minimum.
2. Provide protective clothing, eye protection, and breathing apparatus, as required for authorized inspection personnel, the District, and other authorized personnel upon request.
3. The UWR/PCB work area shall not be left unattended from the start of work activities until all UWR/PCB and incidentals have been sealed in approved containers. If immediate transportation to a UWR/PCB storage facility or disposal facility is not feasible, the work area must be secured in a manner approved by the District.
4. During work procedures and at all, times when UWR/PCB-containing/contaminated fluids in any volume are not sealed in drums, containers, or electrical equipment, all personnel entering the work area must don protective clothing and equipment. Upon exiting the work area, all disposable protective clothing shall be stored in appropriate waste storage drums and sealed, for subsequent transportation to the on-site storage facility or disposal facility.
5. Workers with cuts or scratches shall cover these wounds sufficiently to prevent accidental contact with hazardous materials within the regulated work area, prior to entering the regulated work area. Similarly, workers who incur accidental minor cuts or scratches in the course of work activities will immediately leave the work area, cleanse the wound with medical grade soap, and seal the wound before returning to the work area.

1.9 QUALITY ASSURANCE

- A. Single Party Responsibility: The contractor performing the work shall be responsible for, and shall accomplish all, UWR/PCB-related work activities.
- B. Abatement Contractor Qualifications: The Contractor shall be fully experienced in the handling, storage, and transport of UWR, UWR-contaminated articles, and PCB-related waste, and shall warrant to the District that he/she is familiar with the codes and requirements applicable to UWR/PCB work.

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- C. Waste Hauler Qualifications: Currently licensed by the State of California Department of Public Health for the transporting, handling, and hauling of extremely hazardous wastes, including UWR/PCB-related wastes.

PART 2 - PRODUCTS**2.1 GENERAL**

- A. No materials, equipment, or tools belonging to the District shall be used by the Contractor, except in case of an emergency and upon explicit authorization by the District.
- B. Deliver all materials and equipment to the site in the original containers bearing the name of the manufacturer and details for proper storage and usage.
- C. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner, which shall not interfere with operations of the District.
- D. The District and/or Consultant must approve unloading and temporary storage sites and transfer routes in advance.
- E. Damaged or deteriorated materials may not be used and must be promptly removed from the project site.
- F. All materials, tools, and equipment must comply at a minimum with this specification and all applicable federal, state, and local regulations.

2.2 MATERIALS

- A. Storage Containers:
 - 1. All UWR/PCB fluids and UWR/PCB-contaminated fluids, including flush and cleaning solvents and mixtures, shall be stored in sealed Department of Transportation (DOT) 17E closed top drums or other waste container approved for the storage of these materials.
 - 2. For the purposes of this Section, PCB-contaminated fluids are defined as containing more than 5 but less than 500 parts per million (ppm) PCBs. PCB fluids are defined as containing PCBs in concentration of 500 ppm or greater. Flush solvents shall be assumed to contain more than 500 ppm PCBs.
 - 3. All UWR/PCB soil wastes and items used in the course of work, such as rags, absorbents, and protective clothing, shall be stored in sealed DOT 17C open type drums or other waste container approved for the storage of these materials.
- B. Solvents, Cleaning Agents, and Absorbents:

1. Select an appropriate solvent in which UWR are shown to be soluble. Select an appropriate solvent, in which PCBs are shown to be at least 5% soluble, by weight. Solvents specified by the USEPA include: kerosene, diesel fuel, terpene hydrocarbons, and a mixture of terpene hydrocarbons and terpene alcohols. Care shall be taken to limit the complexity of the waste stream. In all cases where solvents are used in the course of work, provide proper ventilation to ensure that the resulting fumes/vapors are not dispersed to occupied building areas either as a result of natural convection or via air intakes for building ventilation systems.
2. The manufacturer's recommendations for applications and requirements for California Occupational Safety and Health Administration (Cal OSHA) shall be strictly observed.
3. Select an appropriate cleaning agent in which UWR are shown to be soluble. Select an appropriate cleaning agent, in which PCBs are shown to be at least 5% soluble, by weight. Care shall be taken to limit the complexity of the waste stream. Numerous non-toxic cleaning agents, shown to meet or exceed the solubility standard, are commercially available. In all cases where cleaning agents are used in the course of work, provide proper ventilation to ensure that the resulting fumes/vapors are not dispersed to occupied building areas either as a result of natural convection or via air intakes for building ventilation systems. The manufacturer's recommendations for applications and requirements for Cal-OSHA shall be strictly observed.
4. Select an appropriate absorbent.

PART 3 - EXECUTION

3.1 SPILL CLEAN-UP, CONTAINERIZATION, AND MARKING

A. Clean-up of Work Area, UWR/PCB, and Spills:

1. After the last UWR/PCB-containing light ballast has been removed and all fluids and solids have been cleaned from the fixture, all tools and equipment used in the work shall be decontaminated and properly stored for future use.
2. All tools that have come into contact with UWR/PCBs at any concentration will be double washed/rinsed with an appropriate cleaning agent, wiped cleaned, and properly stored.
3. At a minimum, all exterior surfaces of equipment that may have come into contact with UWR/PCBs or contaminated solids or fluids either during the course of work activities or due to past leaks will be double washed/rinsed with an appropriate cleaning agent and wiped clean.
4. All metal surfaces and surfaces with impermeable liners which have come into contact with UWR/PCBs or UWR/PCB mixtures in the course of work or as a result of past leaks shall be thoroughly cleaned using combinations of absorbents and solvents or cleaning agents. Minimum cleaning requirements for these surfaces will include the removal of bulk material and two rinses with the cleaning agent for the affected surfaces. The work area shall be effectively ventilated during operations such that vapors used during decontamination and cleaning

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are not vented to occupied building areas. Upon completion of UWR/PCB-related activities, if fumes or vapors are still present in levels that could impede breathing or be considered toxic under state and/or National Institute of Occupational Safety and Health (NIOSH) standards, the Contractor shall provide additional ventilation to accelerate drying. If needed, auxiliary breathing apparatus may only be used by personnel trained in the use of this equipment and experienced in conducting UWR/PCB-related work while wearing such apparatus, which can impede safe work practices.

5. The USEPA, Region IX, regards soil, asphalt, wood, cement, and concrete as porous materials that absorb UWR/PCBs. Where practical, these materials must be removed when they are within the spill or contamination boundary.
6. Completion of decontamination activities shall be inspected by the Contractor's Environmental Monitor, by collecting an appropriate number and type of samples for the specific UWR and/or PCBs and surfaces. The Contractor is responsible for all cost associated with spill clean-up and oversight.

B. Containerization and Marking:

1. All liquids generated as a result of work activities and clean-up operation shall be placed in appropriate work containers and the containers sealed.
2. All solids, such as absorbents, rags, disposable clothing, soil, and other incidentals, shall be placed in appropriate work containers and the containers sealed.
3. All drums and items containers utilized shall be permanently marked as to the specific contents and dated. In addition, each drum and container shall be marked with the standard Environmental Protection Agency, UWR or PCB label, as appropriate (40 CFR 273) and Hazardous Waste label (40 CFR 262).

3.2 HANDLING AND TRANSPORTATION TO STORAGE FACILITIES

- A. All closed and open top drums must be permanently sealed and marked prior to loading on the transport vehicle. Filled drums shall be loaded onto the transport vehicle by the following methods:

1. By a hoist or lift truck capable of utilizing a two-point drum lifter;
2. By a hoist or lift truck provided with a band-around type drum lifter; or
3. By a lift truck, lifting the drums from underneath by a pallet attached to the drum by a banding arrangement.
4. HEPA vacuum all surfaces in the work area, including walls, ceilings, windows, and floors.

- B. The drums shall not be lifted by:

1. Any rope, chain, or cloth slings tied about the drum;
2. Placement of drums on bare fork lift trucks;
3. Forcing drums between the forks of a lift truck; or
4. Any commercial drum lifter exerting force on the sides of the drums.

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- C. All drums and containers shall be secured to the transport vehicle to prevent movement while in transit.
- D. Transportation:
 - 1. All UWR/PCB items and drums containing liquids, solids, and incidentals shall be transported to an off-site UWR/PCB-approved and permitted recycling/disposal facility.
 - 2. The Contractor performing this section of the work shall be licensed for the transport and hauling of extremely hazardous waste. Provide a route plan that clearly identifies the routes proposed while transporting UWR/PCB items from the various work sites to off-site facilities.
 - 3. A minimum of two operators shall be in attendance at all times while UWR/PCB items are being transported, loaded, and unloaded.
 - 4. A motor carrier driver or other person must comply with the Federal Motor Carrier Safety Rules when he/she is transporting UWR, PCB, or other hazardous materials by a motor vehicle, which must be placarded or marked in accordance with DOT 177.
 - 5. Every motor vehicle transporting or storing items containing UWR, PCB, or other hazardous materials must be operated and parked in compliance with the law, ordinances, and regulations of the state jurisdiction of which it is being operated in, unless they are at variance with specific regulations of the DOT which are applicable to the operation of that vehicle and impose a more stringent obligation or restraint.
 - 6. All containers must be properly secured in place to ensure that no equipment items or containers can come loose or are unsafely placed into the transport vehicle. This may include chaining, roping, strapping, or winching. The driver of the vehicle must stop the vehicle in a safe location at least once during each two hours or 100 miles traveled, whichever is less, and inspect the contents of the shipment. At the time of inspection, if any form of binding is found to be loose, the driver shall immediately take action to remedy the situation for safe transportation.
 - 7. Any equipment, drums, or other items carried in an open, flatbed, or stake type truck shall be covered with a tarp to protect it from the elements.
 - 8. A motor carrier that transports "Hazardous Waste" must furnish the driver of each motor vehicle the following documents:
 - a. A copy of this Section.
 - b. A document containing instruction on procedures to be followed in the case of an accident or delay. The documents must include the names and telephone numbers of the people to be contacted, the types of hazardous wastes being transported, and the precautions taken in emergencies, such as fires, accidents, or leakages.
 - c. Manifest and permit documents described in these specifications and required for waste transport.
 - 9. A motor vehicle being operated must be marked if that vehicle is:

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- a. Transporting UWR, PCBs, or hazardous materials of a kind that require the vehicle be marked or placarded in accordance with DOT 177;
- b. Commercial vehicles must display the name or trade name of the carrier operating the vehicle. These vehicles must display markings that designate the carrier as being a commercial vehicle "for hire."

3.3 UWR/PCB DISPOSAL

- A. Treat and dispose of all UWR/PCB wastes collected and generated during the execution of the Work.
- B. Except as may be otherwise specifically directed in writing by the District Construction Manager, treat and dispose of all waste UWR/PCB materials as governed by 40 CFR 273, California State Regulations, local regulations, and subsequent amendments).
 1. All UWR fluids, flushing fluids, and other UWR contaminants shall be disposed of by incineration or recycling at a facility approved for such use by the USEPA, and all other controlling regulatory agencies and bodies of the state, county, and municipality of that facility's location. If the Contractor so elects, solid UWR wastes may also be incinerated, as suitable and allowed for this type of disposal.
 2. All PCB fluids, flushing fluids, waste oils, and other fluid contaminants whose total PCB content is equal to or greater than 5 ppm (and are therefore restricted to this mode of thermal destruction) shall be disposed of by incineration or recycling at a facility approved for such use by the USEPA, and all other controlling regulatory agencies and bodies of the state, county, and municipality of that facility's location. If the Contractor so elects, solid PCB wastes may also be incinerated, as suitable and allowed for this type of disposal.
- C. Dispose of all UWR/PCB wastes generated as part of these operations in a legal manner.
- D. Do not sell, transfer, or recover any material from the wastes received from the Project without their prior written consent from the District.

3.4 UNLOADING AND PLACING IN STORAGE

- A. Transport vehicles shall be unloaded using the same equipment and methods as for loading (Section 3.2.A and 3.2.B).
- B. Materials shall only be placed in temporary storage if approved in writing by the District Construction Manager.
 1. Drums and other storage containers shall be placed in a storage facility in locations designated by the District.
 2. Drums shall be placed on pallets of sufficient strength to withstand double stacking. Drums shall not be stacked at the time of storage, unless space is

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- limited as determined by the District. Where stacking of drums is necessary, pallets shall be placed between the drum layers.
3. Ample clearance space will be provided around other storage containers in order to facilitate inspection.
- C. Immediately following the unloading of UWR/PCB transport vehicle, inspect the cargo area to check for any fluid leaks. If any fluids are found, the source of the leaking drum or other storage container shall be identified and sealed.
- D. Thoroughly wash/rinse clean with absorbents, solvents, and liquid cleaners the contaminated cargo area. Cleaning agent, solvents, and solids shall be placed in proper drums for disposal.

END OF SECTION 02 84 34

**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 Supplementary Conditions 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.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - e. Vapor Emissions Control System Representative
 - f. Special concrete finish Subcontractor.
 - 2. Review concrete finishes and finishing, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, vapor-retarder installation, concrete mix design including admixtures, Vapor Emissions Control System, quality control and testing including test core repair, anchor rod and

anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures including crack repair, concrete surface sealing, and concrete protection.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- 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.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
 - 2. Include Vapor Emissions Control System.
- 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. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Project Inspector.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer and testing agency.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Fiber reinforcement.
 - 6. Curing compounds.
 - 7. Floor and slab treatments.
 - 8. Bonding agents.
 - 9. Adhesives.
 - 10. Vapor retarders.
 - 11. Semi-rigid joint filler.
 - 12. Joint-filler strips.
 - 13. Repair materials.

14. Vapor Emissions Control System.

D. Material Test Reports: For the following, from a qualified testing agency:

1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.

1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

F. Minutes of pre-installation conference.

G. Sample Warranty: Vapor Emissions Control System

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.

D. Regulatory Requirements: Concrete construction shall conform with the CBC, and requirements specified herein.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: District will engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

- B. Vapor Emissions Control System Components: Store per manufacturer's requirements, including storage temperature and protection from harmful weather conditions.

1.10 FIELD CONDITIONS

- A. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90 deg 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.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.11 WARRANTY

- A. Standard Vapor Emissions Control System Warranty: Manufacturer's standard warranty, applicable regardless of vapor emissions (CC/Rh) test results, without the use of vapor retarder, executed by an authorized company official, in which manufacturer agrees to completely repair or replace all floor finishes that are completely or partially damaged as a result of failure of vapor emissions control system within specified warranty period.
 - 1. Failures include:
 - a. Moisture related failures, including failures due to moisture vapor emissions, and including failures at cracks, expansion joints, saw cuts, and similar features.
 - 2. Warranty Period
 - a. Vapor Emissions Control System, including admixture, curing agent, crack fill binder: Lifetime
 - b. Floor Coverings and Coatings (materials and installation): Lifetime

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301. "Specifications for Structural Concrete".
 - 2. ACI 117. "Specifications for Tolerances for Concrete Construction and Materials".

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
 - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
- 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. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4-by-3/4-inch, minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- I. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1-inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1-inch in diameter in concrete surface.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Deformed-Steel Wire: ASTM A 1064/A 1064M.
- D. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. 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:
 - 1. 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.

2.5 CONCRETE MATERIALS

- A. Source Limitations:
 - 1. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
 - 2. Obtain aggregate from single source.
 - 3. Obtain Vapor Emission Control System components (admixture, curing agent, crack fill binder) from single source from single manufacturer
 - 4. Obtain all other admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type I/II
 - 2. Fly Ash: ASTM C 618, Class F.
 - 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
 - 4. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 1N coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 - 1. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal, nor one third of the slab depth, not three-fourths of the minimum clear spacing between individual reinforcing bars or bundles of bars.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
 3. Do not use aggregates containing spalling causing deleterious substances.
- D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures, flooring materials and adhesives, and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- E. Color Pigment: ASTM C 979/C 979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brickform; a division of Solomon Colors.
 - b. Davis Colors.
 - c. Proline Concrete Tools, Inc.
 - d. Or Equal.
 2. Color: As selected by Architect from manufacturer's full range.
- F. Water: ASTM C 94/C 94M and potable.

2.6 VAPOR RETARDERS

- A. Vapor Retarder: Plastic sheet, ASTM E 1745, Class A.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fortifiber Building Systems Group.
 - b. Raven Industries, Inc.
 - c. Reef Industries, Inc.
 - d. Stego Industries, LLC.
 - e. W.R. Meadows, Inc.
 - f. Or Equal.

2.7 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Euclid Chemical Company (The); an RPM company.
 - b. Kaufman Products, Inc.
 - c. W.R. Meadows, Inc.
 - d. Or Equal.

2.8 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.
 - b. Euclid Chemical Company (The); an RPM company.
 - c. Sika Corporation.
 - d. Or Equal.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating, conforming to VOC requirements of the San Diego Air Pollution Control District.

2.9 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber] [or] [ASTM D 1752, cork or self-expanding cork.
- B. Semi-rigid Joint Filler: Two-component, semi-rigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 according to ASTM D 2240.

- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types I and II, non-load bearing, Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034-inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.10 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150/C 150M, Portland cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8- to 1/4-inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4-inch and that can be filled in over a scarified surface to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150/C 150M, Portland cement as defined in ASTM C 219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8- to 1/4-inch or coarse sand as recommended by topping manufacturer.
 - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.11 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.
- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent. Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows
 - 1. Fly Ash: 15 percent.
 - 2. Combined Fly Ash and Pozzolan: 15 percent.
 - 3. Slag Cement: 40 percent.
 - 4. Combined Fly Ash or Pozzolan and Slag Cement: 40 percent Portland cement minimum, with fly ash or pozzolan not exceeding 15 percent.
 - 5. Silica Fume: 10 percent.
 - 6. Combined Fly Ash, Pozzolans, and Silica Fume: 25 percent with fly ash or pozzolans not exceeding 15 percent and silica fume not exceeding 10 percent.
 - 7. Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 40 percent with fly ash or pozzolans not exceeding 15 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.1 percent by weight of cement.
- D. Admixtures: Use admixtures certified by manufacturer to be compatible with other admixtures, flooring materials and adhesives. Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.45.
 - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved sample.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Normal-weight concrete.

1. Minimum Compressive Strength: As indicated.
2. Maximum W/C Ratio: As indicated.
3. Slump Limit: As indicated.
4. Air Content: As indicated.

B. Foundation Walls: Normal-weight concrete.

1. Minimum Compressive Strength: As indicated.
2. Maximum W/C Ratio: As indicated.
3. Slump Limit: As indicated.
4. Air Content: As indicated.

C. Slabs-on-Grade: Normal-weight concrete.

1. Minimum Compressive Strength: As indicated.
2. Maximum W/C Ratio: As indicated.
3. Slump Limit: As indicated.
4. Air Content: As indicated.

2.13 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."**

2.14 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.**

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

- B. Batch Plant Inspection may be waived provided the concrete plant complies fully with the requirements of ASTM C94, Sections 819, and has been certified by an agency acceptable to O.S.H.P.D. to comply with the requirements of the "National Ready Mixed Concrete Association". The plant must be equipped with an automatic batcher in which the total batching cycle, except for measuring and introduction of an admixture, is completed by activating a single starter device.**

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- 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. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class A, 1/8-inch for smooth-formed finished surfaces.
 - 2. Class C, 1/2-inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEM INSTALLATION

- 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.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.
 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
 3. Determine compressive strength of in-place concrete by testing representative field or laboratory-cured test specimens according to ACI 301.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORING AND RESHORING INSTALLATION

- 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. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. 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.

3.5 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.6 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 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 the Project Inspector.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 4. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. 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.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 2. Terminate full-width joint-filler strips not less than 1/2-inch or more than 1-inch below finished concrete surface where joint sealants, specified in Section 07 92 00 "Joint Sealants," are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by the Project Inspector.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. 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 not to 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 6 inches 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.
- E. 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.

3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: 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.
1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: 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.
1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one 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.

2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 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 matches 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.
- 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.

3.10 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: 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.
 1. Apply scratch finish to surfaces indicated.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.
 1. Apply float finish to surfaces indicated.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten 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.
 1. Apply a trowel finish to surfaces indicated.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
 - b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.

- c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
 - d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.
 - 1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.11 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
 - 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 - 2. Construct concrete bases as indicated, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
 - 3. Minimum Compressive Strength: As indicated.
 - 4. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
 - 5. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 6. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.12 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with 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. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. 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 days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 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 days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 LIQUID FLOOR TREATMENT APPLICATION

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Do not apply to concrete that is less than 28 days' old.
 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

3.14 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by the District Construction Manager. Remove and replace concrete that cannot be repaired and patched to District Construction Manager's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2-inch in any dimension to solid concrete. Limit cut depth to 3/4-inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by the District Construction Manager.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01-inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4- inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas and test cores, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Cracks
 - a. Repair random cracks and single holes 1 inch or less in diameter.
 - b. General: Repair with patching mortar.
 - c. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply

bonding agent. Place crack repair material before bonding agent has dried. Compact crack repair material and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

- E. Perform structural repairs of concrete, subject to District Construction Manager's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to District Construction Manager's approval.

3.16 FIELD QUALITY CONTROL

- A. Special Inspections: District will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Concrete Slab Vapor Emissions Tests: Before installation of flooring finishes over interior concrete slabs, District will have concrete floor slab moisture content tests performed by an independent laboratory to determine the level of vapor transmission in the concrete slabs, slab strength, permeability, pH level and relative humidity. District will submit copies of the test results to the Architect, Project Inspector, and Contractor prior to the installation of the flooring finishes.
- D. 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.

3.17 PROTECTION OF LIQUID FLOOR TREATMENTS

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 03 30 00

**SECTION 05 31 00
STEEL DECKING****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof Deck

1.2 SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings:
 - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has complete steel deck similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code – Sheet Steel."

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

2.2 ROOF DECKS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. ASC Profiles, Inc.; a Blue Scope Steel company.
 - 2. Canam United States; Canam Group Inc.
 - 3. Nucor Corp.; Vulcraft Group.
 - 4. Verco Manufacturing Co.
- B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A 653, Grade 50 Structural Quality (SS), with G60 galvanized coating.
 - 2. Deck Profile: As indicated.
 - 3. Profile Depth: As indicated.
 - 4. Design Uncoated-Steel Thickness: As indicated.
 - 5. Span Condition: As indicated.
 - 6. Side Laps: As indicated.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile indicated.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- H. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.
- I. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- J. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, with 3-inch wide flanges and sloped recessed pans of 1-1/2-inch minimum depth. For drains, cut holes in the field.
- K. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight.
- L. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

3.3 ROOF DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
 - 1. Weld Diameter: As indicated.
 - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.

- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 2 inches, with end joints as follows:
 - 1. End Joints: Lapped 2 inches minimum where indicated; otherwise lapped 2 inches minimum or butted at Contractor's option.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld flanges to top of deck. Space welds not more than 12 inches apart with at least one weld at each corner.
 - 1. Install reinforcing channels or zees in ribs to span between supports and weld.
- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over non-fire-resistive partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field welds will be subject to inspection.
- C. Shear connector welds will be inspected and tested according to the requirements of AWS D1.1 for stud welding and as follows:
 - 1. Shear connector welds will be visually inspected.
 - 2. Bend tests will be performed when visual inspections reveal either less than a continuous 360-degree flash or welding repairs to any shear connector.
 - 3. Tests will be conducted on additional shear connectors when weld fracture occurs on shear connectors already tested, according to the requirements of AWS D1.1.

- D. Testing agency will report inspection results promptly and in writing to Contractor and Engineer.
- E. Remove and replace work that does not comply with specified requirements.
- F. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.6 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 31 00

**SECTION 05 40 00
COLD FORMED METAL FRAMING**

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. Ceiling joist framing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Product Certificates: For each type of code-compliance certification for studs and tracks.
- D. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.

6. Horizontal drift deflection clips
7. Miscellaneous structural clips and accessories.

- E. Evaluation Reports: For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- C. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Stud Manufacturers Association.
- D. Welding Qualifications: Qualify procedures and personnel according to the following:
 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

2.1 COLD-FORMED STEEL FRAMING MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
 1. Grade: ST33H (ST230H) for 18 gauge and lighter, ST50H (ST340H) for 16 gauge and heavier.
 2. Coating: G60 (Z180).
- B. Steel Sheet for Vertical Deflection or Drift Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
 1. Grade: As indicated on drawings.
 2. Coating: G60 (Z180).

2.2 CEILING JOIST FRAMING

- A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, punched with standard holes with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: As indicated on drawings.
2. Flange Width: As indicated on drawings.
3. Section Properties: As indicated on drawings.

2.3 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 1. Supplementary framing.
 2. Bracing, bridging, and solid blocking.
 3. Web stiffeners.
 4. Anchor clips.
 5. End clips.
 6. Foundation clips.
 7. Gusset plates.
 8. Stud kickers and knee braces.
 9. Joist hangers and end closures.
 10. Hole-reinforcing plates.
 11. Backer plates.

2.4 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.
- B. Anchor Bolts: As indicated on drawings.
- C. Post-Installed Anchors: As indicated on drawings
- D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.5 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M.
- B. Cement Grout: Portland cement, ASTM C150/C150M, Type I; and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.
- D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.
- E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

2.6 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
 - 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine substrates, areas, conditions, and abutting structural framing 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.

3.2 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.
- C. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
- D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- E. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- G. Install insulation, specified in Section 072100 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- H. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.4 ERECTION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.

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- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 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 Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Framing with dimension lumber.
 - 2. Rooftop equipment bases and support curbs.
 - 3. Wood blocking and nailers.

1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include 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.
 - 2. 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 a qualified independent testing agency.
 - 3. 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 D 5664.

4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Fire-retardant-treated wood.
3. Power-driven fasteners.
4. Post-installed anchors.
5. Metal framing anchors.

1.6 QUALITY ASSURANCE

- A. 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.
- B. Inspection Agencies:** Inspection agencies, and the reference abbreviations include the following:
1. RIS: Redwood Inspection Service.
 2. WCLIB: West Coast Lumber Inspection Bureau.
 3. WWPA: Western Woods Products Association.

1.7 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, GENERAL

- A. Lumber:** 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.
1. Factory mark each piece of lumber with grade stamp of grading agency.

2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: 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.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
 2. 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.
- B. 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.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
- D. Application: Pressure treat above ground items with waterborne preservatives to a minimum retention of 0.25 lb./cu. ft. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat items indicated on Drawings, and the following:
1. Wood 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.
 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
 5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply 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.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, 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 beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841. For enclosed roof framing, framing in attic spaces, and where high-temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. 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, omit marking and provide certificates of treatment compliance issued by inspection agency.
- E. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.
- F. Application: Treat items indicated on Drawings, and the following:
 - 1. Framing for raised platforms.
 - 2. Concealed blocking.
 - 3. Roof framing and blocking.

4. Wood nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
5. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
 3. Rooftop equipment bases and support curbs.
 4. Furring.
 5. Grounds.
- B. 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.
- C. 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.
- 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.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 1. 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 A 153/A 153M or Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Screws for Fastening to Metal Framing: ASTM C 1002 ASTM C 954, length as 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.
- E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 ICC-ES AC58 ICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat screws.

2.7 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. KC Metals Products, Inc.
 - 2. Simpson Strong-Tie Co., Inc.
 - 3. USP Structural Connectors.
 - 4. Or Equal.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
 - 1. Use for interior locations unless otherwise indicated.

2.8 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025-inch.

PART 3 - EXECUTION**3.1 INSTALLATION, GENERAL**

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set 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.
- 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 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 o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
 - 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
 - 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.
- H. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

- I. Comply with AWWPA 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 California Building Code (CBC).
 - 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.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. 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.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

END OF SECTION 06 10 53

SECTION 07 13 26
SELF-ADHERING SHEET WATERPROOFING

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. Modified bituminous sheet waterproofing for vertical applications.
 - 2. Molded-sheet drainage panels.

1.3 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
 - 1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
 - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

- B. Field quality-control reports.
- C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
 - 1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Installer's Special Warranty: Signed by Installer, covering Work of this Section, for warranty period of five years.
 - 1. Warranty includes removing and reinstalling protection board and drainage panels.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials , protection course, and molded-sheet drainage panels from single source from single manufacturer.

2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. Modified Bituminous Sheet: Minimum 60-mil nominal thickness, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated on one side to a 4-mil-thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle Coatings & Waterproofing Inc.
 - b. Grace Construction Products; W.R. Grace & Co. -- Conn.
 - c. Polyguard Products, Inc.
 - d. Or Equal.
 2. Physical Properties:
 - a. Tensile Strength, Membrane: 250 psi minimum; ASTM D 412, Die C, modified.
 - b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
 - c. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D 1970.
 - d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch movement; ASTM C 836.
 - e. Puncture Resistance: 40 lbf minimum; ASTM E 154.
 - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D 570.
 - g. Water Vapor Permeance: 0.05 perms maximum; ASTM E 96/E 96M, Water Method.
 - h. Hydrostatic-Head Resistance: 200 feet minimum; ASTM D 5385.
 3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
- B. Primer: Liquid waterborne primer recommended for substrate by sheet-waterproofing material manufacturer.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

SELF-ADHERING SHEET WATERPROOFING**07 13 26 - 3****KITCHEN MODIFICATIONS GROUP 6**

- E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.
- F. Metal Termination Bars: Aluminum bars, approximately 1-by-1/8-inch thick, predrilled at 9-inch centers.
- G. Protection Course: ASTM D 6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
 - 1. Thickness: 1/8-inch, nominal.
 - 2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.
- H. Mastic, Adhesives, and Tape: Liquid mastic and adhesives, and adhesive tapes recommended by waterproofing manufacturer.

2.4 MOLDED-SHEET DRAINAGE PANELS

- A. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Composite subsurface drainage panel consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate of 9 to 21 gpm per ft.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle Coatings & Waterproofing Inc.
 - b. Grace Construction Products; W.R. Grace & Co.
 - c. Polyguard Products.
 - d. Or Equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.
 - 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
 - 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
 - 1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16-inch.
- F. Bridge and cover expansion joints with overlapping sheet strips of widths according to manufacturer's written instructions.
 - 1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.
- G. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
 - 1. Install membrane strips centered over vertical inside corners. Install 3/4-inch fillets of liquid membrane on horizontal inside corners and as follows:
 - a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
- H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

3.3 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.

- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch-minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
 - 1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F.
- D. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- E. Seal edges of sheet-waterproofing terminations with mastic.
- F. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.
- G. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.
- H. Immediately install protection course with butted joints over waterproofing membrane.

3.4 MOLDED-SHEET DRAINAGE-PANEL INSTALLATION

- A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesives or other methods that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.
 - 1. For vertical applications, install protection course before installing drainage panels.

3.5 FIELD QUALITY CONTROL

- A. Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish daily reports to District Construction Manager.

3.6 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.

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- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 13 26

**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:
 - 1. Glass-fiber blanket.
 - 2. Glass-fiber board.
- B. Related Requirements:
 - 1. Section 07 13 26 "Self-Adhering Sheet Waterproofing" for insulated drainage panels.
 - 2. Section 07 54 19 "Polyvinyl-Chloride (PVC) Roofing" for insulation specified as part of roofing construction.
 - 3. Section 09 24 00 "Cement Plastering" Section 09 29 00 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

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.

PART 2 - PRODUCTS**2.1 GLASS-FIBER BLANKET**

- A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. Owens Corning.
 - d. Or Equal.

2.2 GLASS-FIBER BOARD

- A. Glass-Fiber Board, Unfaced : ASTM C 612, Type IA; unfaced, with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84, passing ASTM E 136 for combustion characteristics. Nominal density of 2.25 lb/cu. ft, thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. Owens Corning.
 - d. Or Equal.

2.3 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AGM Industries, Inc.
 - b. Cal-Fasteners, Inc.
 - c. Integrity Fasteners, Inc.
 - d. Or Equal.
 - 2. Plate: Perforated, galvanized carbon-steel sheet, 0.030-inch thick by 2 inches square.

3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
- B. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-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 square or in diameter.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. AGM Industries, Inc.
 - b. Cal-Fasteners, Inc.
 - c. Integrity Fasteners, Inc.
 - d. Or Equal.
 2. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:
 - a. Crawl spaces.
 - b. Ceiling plenums.
 - c. Attic spaces.
- C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AGM Industries, Inc.
 - b. Cal-Fasteners, Inc.
 - c. Gemco.
 - d. Or Equal.

2.4 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
- 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.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
 - 5. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
 - 6. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:

- a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
- 7. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
 - a. Exterior Walls: Set units with facing placed toward exterior of construction.
 - b. Interior Walls: Set units with facing placed toward areas of high humidity.
- B. 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.

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 54 19
POLYVINYL-CHLORIDE (PVC) ROOFING

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. Adhered polyvinyl chloride (PVC) roofing system.
- B. Related Requirements:
 - 1. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
 - 2. Section 07 21 00 "Thermal Insulation" for insulation beneath the roof deck.
 - 3. Section 07 62 00 "Sheet Metal Flashing and Trim" for non-PVC coated metal roof flashings and counterflashings.
 - 4. Section 07 92 00 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
 - 1. Meet with District Construction Manager, Project Inspector, Architect, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base tie-ins, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include roof plans, elevations, sections, details, and attachments to other work, including:
 1. Base flashings and membrane terminations.
 2. Tapered insulation, thicknesses, and slopes.
 3. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
 5. Walkways
- C. Samples for Verification: For the following products:
 1. Roofing membrane, of color required.
 2. Walkway pads or rolls, of color required.
 3. Roof insulation.
 4. PVC coated metal of color required.
 5. Metal termination bars.
 6. Three fasteners of each type and finish.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.
- B. Manufacturer Certificates:
 1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of compliance with performance requirements.

2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.
- C. Product Test Reports: For roof membrane and insulation, tests performed by independent qualified testing agency indicating compliance with specified requirements.
- D. Field quality-control reports.
- E. Sample Warranties: For manufacturer's special warranties.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. Information Card: Furnish a typewritten card, laminated in plastic. Card shall be 8-1/2-by-11 inches and shall contain the information listed on Form 1 located at end of this section.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period, without monetary limitation.
 - 1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, substrate board and other components of roofing system.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain components including roof insulation fasteners for roofing system from same manufacturer as roof membrane or manufacturer approved by roof membrane manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.
 - 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Energy Performance: Roofing system shall have a minimum aged solar reflectance of 0.63 and a minimum thermal emittance of 0.75 or a minimum solar reflectance index (SRI) of 75 when tested according to CRRC-1.

- D. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A, for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.3 PVC ROOFING

- A. PVC Sheet: ASTM D 4434/D 4434M, Type III, fabric reinforced.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. Sika Sarnafil.
 - c. GAF Materials Corporation.
 - d. Or Equal.
 - 2. Thickness: 80 mils nominal on horizontal surfaces.
 - 3. Plasticizer: Either keytone ethylene ester (KEE) formulated into the membrane composition, or liquid plasticizers coated in the factory to prevent migration.
 - 4. Exposed Face Color: White.

2.4 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
 - 1. Adhesives and Sealants: Comply with VOC limits of San Diego Air Pollution control District.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, and color as PVC sheet.
- C. Bonding Adhesive: Manufacturer's standard, water based for horizontal applications; solvent based for vertical applications.
- D. Asphalt Shield: Fabricate from galvanized steel, .022-inch thick.
- E. Asphalt Shield: Plywood, 1/2-inch thick nominal, Exposure 1.
- F. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1-by-1/8-inch-thick; with anchors.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate, and acceptable to roofing system manufacturer.

- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.5 PVC COATED SHEET METAL

- A. Roof membrane manufacturer's standard .028-inch thick minimum galvanized sheet metal laminated to minimum 20-mil-thick non-reinforced PVC membrane. Color to match roofing membrane.

2.6 SUBSTRATE BOARDS

- A. Substrate Board: Substrate board must be the product that was used in testing the roof assembly to gain a Class A rating.
 - 1. Glass-mat faced water-resistant gypsum substrate.
 - 2. High density polyisocyanurate foam core board, 1/2-inch-thick.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate board to roof deck.

2.7 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured by PVC roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses to achieve slopes and R-values indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
- C. Perlite Board Insulation: ASTM C 728, Type I, rigid, mineral-aggregate thermal insulation board composed of expanded perlite, cellulosic fibers, binders, and waterproofing agents with top surface seal coated.
- D. Tapered Insulation: Provide factory-tapered insulation boards.
 - 1. Material: Match roof insulation.
 - 2. Minimum Thickness: 1/4-inch (6.35 mm).
 - 3. Slope:
 - a. Roof Field: 1/4-inch per foot (1:48) unless otherwise indicated on Drawings.
- E. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.8 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and substrate boards to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 - 1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
 - 2. Full-spread spray-applied, low-rise, two-component urethane adhesive.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 05 31 00 "Steel Decking."
 - 4. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 - 5. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than 75 percent, or as recommended by roofing system manufacturer, when tested according to ASTM F 2170.
 - a. Test Frequency: One test probe per each 1000 sq. ft. (93 sq. m), or portion thereof, of roof deck, with no fewer than three test probes.
 - b. Submit test reports within 24 hours of performing tests.
 - 6. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.

3.4 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.
 - 1. Tightly butt substrate boards together.
 - 2. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
- B. Mechanically Fastened Substrate Board: Secure to deck using mechanical fasteners specifically designed and sized for fastening specified board to deck type.
 - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
- C. Adhered Substrate Board Installation: Install substrate board and adhere to insulation as follows:
 - 1. Set substrate board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining board in place.
 - 2. Set substrate board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining board in place.

3.5 ASPHALT SHIELD INSTALLATION

- A. Install asphalt shield as indicated to provide complete separation of PVC roofing from substrate.

3.6 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is greater than 3/4-inch, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4-inch with insulation.
 - 1. Cut and fit insulation within 1/4-inch of nailers, projections, and penetrations.
- G. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
 - 1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 - 2. Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- H. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
- I. Mechanically Fastened and Adhered Insulation: Install each layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
 2. Set each subsequent layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 3. Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- J. Install slip sheet over existing substrate.

3.7 ADHERED ROOFING INSTALLATION

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roof membrane and allow to relax before installing.
- B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- C. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- E. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeter of roofing.
- F. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roof membrane and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof membrane and sheet flashings.
 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- H. Spread sealant bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.8 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.9 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products according to manufacturer's written instructions in locations indicated on Drawings. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.10 FIELD QUALITY CONTROL

- A. Roofing Inspector: District will engage a qualified roofing inspector to inspect substrate conditions, surface preparation, roof membrane application, flashings, protection, and drainage components.
- B. For testing and inspections not provided by District and as specified herein, provide qualified personnel and furnish reports to Project Inspector.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of District Construction Manager, and to prepare inspection report.
- D. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.11 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and District Construction Manager.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

FORM 1 – ROOFING SYSTEM DESCRIPTION

1. Location:_____ 2. Bldg. Name:_____
3. Bldg. No.:_____ 4. Roof Area (SF):_____ 5. Contract No.:_____
6. Deck Slope:_____
7. Type of Deck:
- ☐ Metal ☐ Wood Plank or Plywood
☐ Cast-In-Place Concrete ☐ Other:_____
☐ Precast/Prestressed Concrete
8. Type of Insulation Board:
- ☐ Polyisocyanurate/Composite ☐ Polyisocyanurate
☐ Polystyrene/Composite ☐ Polystyrene
☐ Perlite ☐ Mineral Fiber
☐ Other:_____
9. Insulation Manufacturer:_____
10. Insulation Thickness:_____
11. Roofing Type:
- ☐ Built-Up (Asphalt) ☐ PVC
☐ Metal ☐ SBS Mod. Bitumen
☐ Shingles ☐ Other:_____
12. Roofing Manufacturer:_____
13. Roofing Installer/Warrantor:_____
14. Roofing Application Method:
- ☐ Bitumen ☐ Fully Adhered
☐ Mechanically Fastened ☐ Mechanically Fastened/Fully Adhered
☐ Other:_____
15. Warranty Period: From:_____ To:_____
16. Warranty Serial Number:_____
17. Date Roofing Completed:_____ 18. Inspector:_____
19. Prime Contractor Name/Address:_____

Signature: _____ Date: _____

INSTRUCTIONS FOR FORM 1 (Do Not Post)

1. Location: Name of facility as shown on contract.
2. Bldg. Name: As shown on contract or as provided by District Construction Manager.
3. Bldg. Number: As provided by District Construction Manager.
4. Roof Area: Area in square feet of roof for which deck insulation, membrane, etc. are the same. A separate form is required if any part of roof system is different over other areas of the roof.
5. Contract Number: As shown on the contract.
6. Show deck slope.
7. Deck: Check appropriate block.
8. Type of Insulation Board: Check appropriate block.
9. Show manufacturer of insulation.
10. Show minimum thickness of installed insulation.
11. Roofing Type: Check appropriate block.
12. Show roofing manufacturer's name.
13. Roofing Installer's or Contractor's name.
14. Roofing Application Method: Check appropriate block.
15. Warranty Period: Insert start and end dates.
16. Warranty Serial Number: Insert serial number.
17. Show date of Substantial Completion. Warranty period begins on this date.
18. Show Project Inspector's name.
19. Prime Contractor Name/Address/Signature: Must be signed and dated by an official of Contracting firm.

END OF SECTION 07 54 19

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. Section Includes:
 - 1. Manufactured reglets with counterflashing.
 - 2. Formed roof-drainage sheet metal fabrications.
 - 3. Formed low-slope roof sheet metal fabrications.
 - 4. Formed steep-slope roof sheet metal fabrications.
 - 5. Formed wall sheet metal fabrications.
 - 6. Formed equipment support flashing.
 - 7. Formed overhead-piping safety pans.
- B. Related Requirements:
 - 1. Section 07 72 00 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leak proof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details, including attachments to other work.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter flashings as applicable.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches.

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install roof edge flashings capable of resisting the following design pressure:
 - 1. Design Pressure: As indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 coating designation; prepainted by coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Surface: Smooth, flat.
 - 2. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 3. Color: As selected by Architect from manufacturer's full range.

4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5-mil.

2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.
- B. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F; and complying with physical requirements of ASTM D 226/D 226M for Type I and Type II felts.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Atlas Roofing Corporation.
 - b. Kirsch Building Products, LLC.
 - c. SDP Advanced Polymer Products Inc.
 - d. Or Equal.
- C. Self-Adhering, High-Temperature Sheet: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle Coatings & Waterproofing Inc.
 - b. Henry Company.
 - c. Owens Corning.
 - d. Or Equal.
 2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.
 3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F. or lower.
- D. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing

and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - 2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- C. Solder:
 - 1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, with maximum lead content of 0.2 percent.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2-inch wide and 1/8-inch thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- G. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fry Reglet Corporation.
 - b. Hickman Company, W. P.
 - c. IMETCO

- d. Or equal.
- 2. Material: Galvanized steel, 0.028 inch thick.
- 3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
- 4. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
- 5. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
- 6. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
- 7. Accessories:
 - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
 - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.
- 8. Finish: As selected by Architect from manufacturer's full range..

2.6 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4-inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

2.7 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.
 1. Gutter Profile: As indicated on Drawings.
 2. Expansion Joints: Lap type.
 3. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen.
 4. Gutters with Girth up to 25 Inches: Fabricate from the following materials:
 - a. Galvanized Steel: 0.034-inch minimum thick.
 5. Gutters with Girth 26 to 30 Inches: Fabricate from the following materials:
 - a. Galvanized Steel: 0.040-inch thick.
 6. Gutters with Girth 31 to 35 Inches: Fabricate from the following mater Galvanized Steel: 0.052-inch thick:
 - a. Galvanized Steel: 0.052-inch thick.
- B. Downspouts: Fabricate round downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers. Shop fabricate elbows.

1. Hanger Style: As indicated on Drawings.
2. Fabricate from the following materials:
 - a. Galvanized Steel: 0.028-inch thick.

2.8 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long sections. Furnish with 6-inch-wide, joint cover plates.
 1. Joint Style: Overlapped, 4 inches wide.
 2. Fabricate with scuppers spaced 10 feet apart, to dimensions required with 4-inch-wide flanges and base extending 4 inches beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
 3. Fabricate from the Following Materials:
 - a. Galvanized Steel: 22 gage / 0.03125-inch minimum thick.
- B. Roof-to-Wall Transition Expansion-Joint Cover: Fabricate from the following materials: Shop fabricate interior and exterior corners.
 1. Galvanized Steel: 20 gage / 0.0375-inch minimum thick.
- C. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
 1. Galvanized Steel: 22 gage / 0.03125-inch minimum thick.
- D. Flashing Receivers: Fabricate from the following materials:
 1. Galvanized Steel: 22 gage / 0.03125-inch minimum thick.
- E. Roof-Penetration Flashing: Fabricate from the following materials:
 1. Galvanized Steel: 22 gage / 0.03125-inch minimumthick.
- F. Roof-Drain Flashing: Liquid-applied elastomeric membrane flashing system compatible with roofing system.
 1. PermaFlash System as manufactured by Johns Manville.
 2. Or Equal

2.9 WALL SHEET METAL FABRICATIONS

- A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch-high, end dams. Fabricate from the following materials:

1. Galvanized Steel: 0.028-inch thick.
- B. Wall Expansion-Joint Cover: Fabricate from the following materials:
 1. Galvanized Steel: 0.028-inch thick.

2.10 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following materials:
 1. Galvanized Steel: 0.028-inch thick.
- B. Overhead-Piping Safety Pans: Fabricate from the following materials:
 1. Galvanized Steel: 0.028-inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 1. Verify compliance with requirements for installation tolerances of substrates.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
- B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
- C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water,

with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

- D. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 - 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 - 5. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 - 1. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4-inch for wood screws substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1-inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder metallic-coated steel sheet.
 2. Do not use torches for soldering.
 3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Fasten gutter spacers to front and back of gutter.
 2. Anchor and loosely lock back edge of gutter to continuous cleat.
 3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
 4. Anchor gutter with gutter brackets spaced not more than 24 inches apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
 5. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.
 6. Install continuous gutter screens on gutters with noncorrosive fasteners, hinged to swing open for cleaning gutters.
- C. Downspouts: Join sections with 1-1/2-inch telescoping joints.
1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c.
 2. Provide elbows at base of downspout to direct water away from building.

- D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches in direction of water flow.
- E. Roof Drains: Install per drain and flashing manufacturers' instructions.

3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means of snap-in installation and sealant unless otherwise indicated.
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.7 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.
- B. Overhead-Piping Safety Pans: Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

3.8 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.9 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00

**SECTION 07 72 00
ROOF ACCESSORIES**

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof curbs.
 - 2. Equipment supports.
 - 3. Pipe and duct supports.
- B. Related Sections:
 - 1. Section 07 62 00 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.

1.3 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof accessories.

1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 1. Size and location of roof accessories specified in this Section.
 2. Method of attaching roof accessories to roof or building structure.
 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 4. Required clearances.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Standards: Comply with the following:
 1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

2.2 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Air Balance Inc.; a division of MESTEK, Inc.
 - b. Bristolite Daylighting Systems, Inc.
 - c. Greenheck Fan Corporation.
 - d. Or Equal.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Supported Load Capacity: As indicated on Drawings.
- D. Material: Zinc-coated (galvanized) steel sheet, 0.052-inch thick.
 1. Finish: Factory prime coating.
- E. Material: Aluminum sheet, 0.090-inch thick.
- F. Finish: Factory prime coating. Construction:
 1. Curb Profile: Manufacturer's standard compatible with roofing system.
 2. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
 3. Fabricate curbs to minimum height of 10 inches above roofing surface unless otherwise indicated.
 4. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange or by use of leveler frame.
 5. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
 6. Insulation: Factory insulated with 1-1/2-inch-thick glass-fiber board insulation.
 7. Liner: Same material as curb, of manufacturer's standard thickness and finish.
 8. Nailer: Factory-installed wood nailer along top flange of curb, continuous around curb perimeter.
 9. Platform Cap: Where portion of roof curb is not covered by equipment, provide weathertight platform cap formed from 3/4-inch thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
 10. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.

2.3 EQUIPMENT SUPPORTS

- A. Equipment Supports: Rail-type metal equipment supports capable of supporting superimposed live and dead loads between structural supports, including equipment loads and other construction indicated on Drawings, spanning between structural supports; capable of meeting performance requirements; with welded or mechanically

fastened and sealed corner joints, integral metal cant, and integrally formed structure-mounting flange at bottom.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. AES Industries, Inc.
- b. Air Balance Inc.; a division of MESTEK, Inc.
- c. Greenheck Fan Corporation.
- d. Or Equal.

- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.

- C. Supported Load Capacity: As indicated on Drawings.

- D. Material: Zinc-coated (galvanized) steel sheet, 0.052-inch thick.

1. Finish: Factory prime coating.

- E. Material: Aluminum sheet, 0.090-inch thick.

- F. Finish: Factory prime coating. Construction:

1. Curb Profile: Manufacturer's standard compatible with roofing system.
2. Nailer: Factory-installed continuous wood nailers 3-1/2 inches wide on top flange of equipment supports, continuous around support perimeter.
3. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as equipment support.
4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
5. Fabricate equipment supports to minimum height of [10 inches above roofing surface unless otherwise indicated.
6. Sloping Roofs: Where roof slope exceeds 1:48, fabricate each support with height to accommodate roof slope so that tops of supports are level with each other. Equip supports with water diverters or crickets on sides that obstruct water flow.

2.4 PIPE AND DUCT SUPPORTS

- A. Fixed-Height Cradle-Type Pipe Supports: Polycarbonate pipe stand accommodating up to 1-1/2-inch- diameter pipe or conduit; with provision for pipe retainer and with manufacturer's support pad or deck plate as recommended for penetration-free installation over roof membrane type; as required for quantity of pipe runs and sizes.
- B. Fixed-Height Roller-Bearing Pipe Supports: Polycarbonate pipe stand with polycarbonate roller carrying assembly accommodating up to 7-inch- diameter pipe or conduit; with provision for pipe retainer and with manufacturer's support pad or deck

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plate as recommended for penetration-free installation over roof membrane type; as required for quantity of pipe runs and sizes.

- C. Adjustable-Height Roller-Bearing Pipe Supports: Polycarbonate pipe stand base, pipe support, and roller housing, with stainless-steel threaded rod designed for adjusting support height, accommodating up to 18-inch diameter pipe or conduit; with provision for pipe retainer and with manufacturer's support pad or deck plate as recommended for penetration-free installation over roof membrane type; as required for quantity of pipe runs and sizes.
- D. Adjustable-Height Structure-Mounted Pipe Supports: Extruded-aluminum tube, filled with urethane insulation; 2 inches in diameter; accommodating up to 7-inch- diameter pipe or conduit, with provision for pipe retainer; with aluminum baseplate, EPDM base seal, manufacturer's recommended hardware for mounting to structure or structural roof deck as indicated, stainless-steel roller and retainer, and extruded-aluminum carrier assemblies; as required for quantity of pipe runs and sizes.
- E. Curb-Mounted Pipe Supports: Galvanized steel support with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom; with adjustable-height roller-bearing pipe support accommodating up to 20-inch diameter pipe or conduit and with provision for pipe retainer; as required for quantity of pipe runs and sizes.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. MIRO Industries, Inc.
 - b. Pate Company (The).
 - c. PHP Systems/Design.
 - d. Or Equal.
- F. Duct Supports: Extruded-aluminum, urethane-insulated supports, 2 inches in diameter; with manufacturer's recommended hardware for mounting to structure or structural roof deck.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Eberl Iron Works, Inc.
 - b. PHP Systems Design.
 - c. Thaler Metal Industries Ltd.
 - d. Or Equal.
 - 2. Finish: Manufacturer's standard.

2.5 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90coating designation .

1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
 2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2-mil.
- B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50coated.
1. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2-mil.
- C. Aluminum Sheet: ASTM B 209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
1. Mill Finish: As manufactured.
 2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2-mil.
- D. Aluminum Extrusions and Tubes: ASTM B 221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.
- E. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.
- F. Steel Tube: ASTM A 500/A 500M, round tube.
- G. Galvanized-Steel Tube: ASTM A 500/A 500M, round tube, hot-dip galvanized according to ASTM A 123/A 123M.
- H. Steel Pipe: ASTM A 53/A 53M, galvanized.

2.6 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Glass-Fiber Board Insulation: ASTM C 726, nominal density of 3 lb/cu. ft., thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F, thickness as indicated.
- C. Polyisocyanurate Board Insulation: ASTM C 1289, thickness and thermal resistivity as indicated.
- D. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches thick.

- E. Security Grilles: 3/4-inch diameter, ASTM A 1011/A 1011M steel bars spaced 6 inches o.c. in one direction and 12 inches o.c. in the other; factory finished as follows:
1. Surface Preparation: Remove mill scale and rust, if any, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 2. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment.
 3. Shop Primer: Manufacturer's or fabricator's standard, fast-curing, lead- and chromate-free, universal primer; selected for resistance to normal atmospheric corrosion, for compatibility with substrate and field-applied finish paint system indicated, and for capability to provide a sound foundation for field-applied topcoats under prolonged exposure.
- F. Bituminous Coating: SSPC-12, cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M. Free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coating.
- G. Underlayment:
1. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
 2. Polyethylene Sheet: 6-mil-thick polyethylene sheet complying with ASTM D 4397.
 3. Slip Sheet: Building paper, 3 lb/100 sq. ft minimum, rosin sized.
 4. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 5. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
 6. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
 7. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- H. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- I. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- J. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

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- K. Asphalt Roofing Cement: ASTM D 4586/D 4586M, asbestos free, of consistency required for application.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- 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.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction involving roof accessories to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight.
 - 3. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 4. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 5. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces

with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
 3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof Curb Installation: Install each roof curb so top surface is level.
- D. Equipment Support Installation: Install equipment supports so top surfaces are level with each other.
- E. Roof-Hatch Installation:
1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
 2. Attach safety railing system to roof-hatch curb.
 3. Attach ladder-assist post according to manufacturer's written instructions.
- F. Heat and Smoke Vent Installation:
1. Install heat and smoke vent so top perimeter surfaces are level.
 2. Install and test heat and smoke vents and their components for proper operation according to NFPA 204.
- G. Gravity Ventilator Installation: Verify that gravity ventilators operate properly and have unrestricted airflow. Clean, lubricate, and adjust operating mechanisms.
- H. Pipe Support Installation: Comply with MSS SP-58 and MSS SP-89. Install supports and attachments as required to properly support piping. Arrange for grouping of parallel runs of horizontal piping, and support together.
1. Pipes of Various Sizes: Space supports for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
- I. Preformed Flashing-Sleeve Installation: Secure flashing sleeve to roof membrane according to flashing-sleeve manufacturer's written instructions; flash sleeve flange to surrounding roof membrane according to roof membrane manufacturer's instructions.
- J. Operational Units: Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.
- K. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 09 91 13 "Exterior Painting."
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 72 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:
 - 1. Nonstaining silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Mildew-resistant joint sealants.
- B. Related Requirements:
 - 1. Section 32 13 73 "Concrete Paving Joint Sealants" for sealing joints in paved roads, parking lots, walkways, and curbing.

1.3 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.

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4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.
- C. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
- D. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.7 PRECONSTRUCTION TESTING

- A. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, and curing time.
- B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.9 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.10 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Manufacturer's standard.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant in the Elastomeric Joint-Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.
- C. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- D. Sealants shall comply with the testing and product requirements of San Diego Air Pollution Control District Rule 67.0 "Architectural Coatings" and Rule 67.21 "Adhesive Material Application Operations".

- E. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food; provide products that comply with 21 CFR 177.2600.

2.2 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Corning Corporation.
 - b. Pecora Corporation.
 - c. Tremco Incorporated.
 - d. Or Equal.

2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, T, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Uses T and NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF / Sonneborn Corporation.
 - b. Sika Corporation.
 - c. Tremco Incorporated.
 - d. Or Equal.

2.4 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Dow Corning Corporation.
- b. Pecora Corp.
- c. Tremco Incorporated.
- d. Or Equal.

2.5 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 - 4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

- 1. Joint Locations:

- a. Construction joints in cast-in-place concrete.
- b. Joints between plant-precast architectural concrete units.
- c. Control and expansion joints in unit masonry.
- d. Joints in dimension stone cladding.
- e. Joints in glass unit masonry assemblies.
- f. Joints in exterior insulation and finish systems.
- g. Joints between metal panels.
- h. Joints between different materials listed above.
- i. Perimeter joints between materials listed above and frames of doors and louvers.
- j. Control and expansion joints in ceilings and other overhead surfaces.
- k. Other joints as indicated on Drawings.

- 2. Joint Sealant: Silicone, nonstaining, Type S, Grade NS, Class 50, Use NT.
- 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

- 1. Joint Locations:

- a. Isolation joints in cast-in-place concrete slabs.
- b. Control and expansion joints in stone flooring.
- c. Control and expansion joints in brick flooring.
- d. Control and expansion joints in tile flooring.
- e. Other joints as indicated on Drawings.

- 2. Joint Sealant: Urethane, Type S, Grade NS, Class 25, Use T, NT.
- 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- C. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Silicone, mildew resistant, acid curing, Type S, Grade NS, Class 25, Use NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Tile control and expansion joints.
 - c. Vertical joints on exposed surfaces of walls and partitions.
 - d. Joints on underside of plant-precast structural concrete beams and planks.
 - e. Other joints as indicated on Drawings.
 2. Joint Sealant: Urethane, Type S, Grade NS, Class 25, Use NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 07 92 00

**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. Section includes:
 - 1. Mechanical door hardware for the following:
 - a. Swinging doors.
 - 2. Cylinders for door hardware specified in other Sections.
 - 3. Electrified door hardware, including components related to electrified storefront entrances, and chain link and decorative metal gates.
 - 4. Gate hardware for hollow metal doors used as gates.
- B. Related Sections:
 - 1. Section 32 31 13 "Chain Link Fences and Gates" for coordination of electrified hardware and balance of hardware for chain link gates.

1.3 ABBREVIATIONS

- A. The following abbreviations are used to identify manufacturers in Part 3 Door Hardware Schedule Article:
 - 1. B/O.
 - 2. FIN.
 - 3. GLY (Glynn-Johnson).
 - 4. IVE (Ives, an Allegion brand).
 - 5. KEE.
 - 6. LCN (LCN, an Allegion brand).
 - 7. NGP.
 - 8. SCE.
 - 9. SCH Schlage, an Allegion brand).
 - 10. TRI (Trimco).
 - 11. VON (Von Duprin, an Allegion brand).
 - 12. Allegion plc.

13. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
14. Door Controls International, Inc.
15. Folger Adam Security Inc.; an ASSA ABLOY Group company.
16. GLY (Glynn-Johnson).
17. Hager Companies.
18. IVE (Ives, an Allegion brand).
19. Key Control Systems, Inc.
20. LCN (LCN, an Allegion brand).
21. Lund Equipment Co., Inc.
22. MMF Industries.
23. National Guard Products, Inc.
24. Reese Enterprises, Inc.
25. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
26. SARGENT Manufacturing Company; ASSA ABLOY.
27. SCH (Schlage, an Allegion brand).
28. Stanley Commercial.
29. TRI (Trimco).
30. VON (Von Duprin, an Allegion brand).
31. Zero International, Inc.

1.4 COORDINATION

- A. All electrified hardware, including exit devices, shall be by the same manufacturer throughout the project, including storefront entrances, chain link gates, and decorative metal gates.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with District's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operations.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 2. Inspect and discuss preparatory work performed by other trades.
 3. Inspect and discuss electrical roughing-in for electrified door hardware. Confirm all electrified hardware is by the same manufacturer throughout the project, including storefront entrances, and chain link and decorative metal gates.
 4. Review sequence of operation for each type of electrified door hardware.
 5. Review required testing, inspecting, and certifying procedures.
- B. Keying Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." In addition to District Construction Manager, Contractor, and Architect, conference participants shall also include Supplier's Architectural Hardware Consultant and District's security consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 2. Preliminary key system schematic diagram.
 3. Requirements for key control system.
 4. Requirements for access control.
 5. Confirm all electrified hardware is by the same manufacturer throughout the project, including storefront entrances, and chain link and decorative metal gates.
 6. Address for delivery of keys.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Details of electrified door hardware, indicating the following:
1. Wiring Diagrams: For power, signal, and control wiring and including the following:
 - a. Details of interface of electrified door hardware and building safety and security systems.
 - b. Schematic diagram of systems that interface with electrified door hardware.
 - c. Point-to-point wiring.
 - d. Risers.
 - e. Elevations of doors controlled by electrified door hardware.
 2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

- C. Samples for Verification: For exposed door hardware of each type required, in each finish specified, prepared on Samples of size indicated below. Tag Samples with full description for coordination with the door hardware schedule. Submit Samples before, or concurrent with, submission of door hardware schedule.
1. Sample Size: Full-size units or minimum 2-by-4-inch samples for sheet and 4-inch long Samples for other products.
 - a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.
- D. Other Action Submittals:
1. Door Hardware Schedule: Prepared by or under the supervision of Architectural Hardware Consultant, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
 - b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
 - c. Content: Include the following information:
 - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
 - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
 - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
 - 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
 - a) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.
 - 5) Fastenings and other pertinent information.

- 6) Explanation of abbreviations, symbols, and codes contained in schedule.
 - 7) Mounting locations for door hardware.
 - 8) List of related door devices specified in other Sections for each door and frame.
2. Keying Schedule: Prepared by or under the supervision of Architectural Hardware Consultant, detailing District's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Architectural Hardware Consultant.
- B. Product Certificates: For door hardware, from the manufacturer.
 1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
- C. Product Test Reports: For compliance with requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency for latches.
- D. Field quality control test reports.
- E. Warranty: Special warranty specified in this Section.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule

1.9 QUALITY ASSURANCE

- A. Supplier Qualifications: Supplier shall be a qualified direct distributor of the manufacturer's products. The Supplier shall have in its regular employment a person who is currently certified by DHI as an Architectural Hardware Consultant (AHC) or a Certified Door Consultant (CDC). The Supplier, and their AHC or CDC, shall be available at reasonable times throughout the Project for consultation with Contractor, Architect, and District Construction Manager. The Supplier shall be available for in-person on-site consultation within 48 hours of first notice.
- B. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers.
 1. Warehousing Facilities: In Project's vicinity.

2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- C. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as an Architectural Hardware Consultant.
- D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.
- E. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
1. Air Leakage Rate: Maximum air leakage of 3.0 cfm/sq. ft. at the tested pressure differential of 0.1-inch wg of water.
- F. Accessibility Requirements: Comply with applicable provisions in the CBC and the DOJ's 2010 ADA Standards for Accessible Design for door hardware on doors in an accessible route.
1. Provide operating devices that are operable with one hand and that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 pounds.
 2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 pounds applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 pounds applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force shall not exceed 15 pounds applied perpendicular to the door.
 - d. Other Operating Parts: For latch bolts and other such devices, 5 pounds.
 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2-inch high.
 4. Closers: Adjust door and gate closer sweep periods so that, from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.
 5. Spring Hinges: Adjust door and gate spring hinges so that, from an open position of 70 degrees, the time required to move the door to the closed position is 1.5 seconds minimum.

6. Door hardware shall not project into the required clear door opening width below 34 inches above finish floor or grade, and shall not project more than 4 inches into the required clear door opening width between 34 inches and 80 inches above finish floor or grade. Door closers and stops shall be located a minimum of 78 inches above finish floor or grade.
7. Operable parts of handles, pulls, locks, latches, and other hardware items shall be located between 34 inches and 44 inches above finish floor or grade.
8. Floor stops shall not be located in the path of travel and shall be a maximum of 4 inches from wall.
9. Pairs of Doors: Limit swing of one leaf to 90 degrees so that a clear floor space is provided beyond the arc of the swing for the wall-mounted sign.
10. Night Latch Function: Door hardware, (including panic hardware) shall not be provided with "Night Latch" (NL) function unless the following conditions are met:
 - a. Such hardware has a 'dogging' feature.
 - b. It is dogged during the time the facility is open.
 - c. Such 'dogging' operation is performed only by employees as part of their job function (non-public use).

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- C. Deliver keys to manufacturer of key control system for subsequent delivery to District.
- D. Deliver keys to District by registered mail or overnight package service.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 1. Failures include:
 - a. Structural failures including excessive deflection, cracking, or breakage.
 - b. Faulty operation of doors and door hardware.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 2. Warranty Period: Two years from date of Substantial Completion, except as follows:

- a. Mortise Locksets: Three years mechanical and one year electrical from date of Substantial Completion.
- b. Exit Devices: Three years mechanical and one year electrical from date of Substantial Completion.
- c. Closers: Ten years mechanical and two years electrical from date of Substantial Completion.

1.12 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for District's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain each type of door hardware from a single manufacturer.
 - 1. All electrified hardware shall be by the same manufacturer throughout the project, including storefront entrances and chain link and decorative metal gates.
 - 2. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
 - 3. Manufacturers that perform electrical modifications and that are listed by a qualified testing and inspecting agency are acceptable.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.
- B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - 1. Air Leakage Rate: Maximum air leakage of 3.0 cfm/sq. ft. at the tested pressure differential of 0.1-inch wg of water.
- C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a qualified testing agency.

- D. Accessibility Requirements: Comply with applicable provisions in the CBC and the DOJ's 2010 ADA Standards for Accessible Design for door hardware on doors in an accessible route.
1. Provide operating devices that are operable with one hand and that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 pounds.
 2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 pounds applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 pounds applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force shall not exceed 15 pounds applied perpendicular to the door.
 - d. Other Operating Parts: For latch bolts and other such devices, 5 pounds.
 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2-inch high.
 4. Closers: Adjust door and gate closer sweep periods so that, from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.
 5. Spring Hinges: Adjust door and gate spring hinges so that, from an open position of 70 degrees, the time required to move the door to the closed position is 1.5 seconds minimum.
 6. Door hardware shall not project into the required clear door opening width below 34 inches above finish floor or grade, and shall not project more than 4 inches into the required clear door opening width between 34 inches and 80 inches above finish floor or grade. Door closers and stops shall be located a minimum of 78 inches above finish floor or grade.
 7. Operable parts of handles, pulls, locks, latches, and other hardware items shall be located between 34 inches and 44 inches above finish floor or grade.
 8. Floor stops shall not be located in the path of travel and shall be a maximum of 4 inches from wall.
 9. Pairs of Doors: Limit swing of one leaf to 90 degrees so that a clear floor space is provided beyond the arc of the swing for the wall-mounted sign.
 10. Night Latch Function: Door hardware, (including panic hardware) shall not be provided with "Night Latch" (NL) function unless the following conditions are met:
 - a. Such hardware has a 'dogging' feature.
 - b. It is dogged during the time the facility is open.
 - c. Such 'dogging' operation is performed only by employees as part of their job function (non-public use).

2.3 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products complying with BHMA designations referenced.
 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
1. Named Manufacturers' Products: Manufacturer and product designations are listed for each door hardware item for the purpose of establishing minimum requirements and level of quality. Provide products complying with these requirements for description, quality, and function.

2.4 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
1. Mortise Locks: Minimum 3/4-inch latchbolt throw.
 2. Deadbolts: Minimum 1-inch bolt throw.
- C. Lock Backset: 2-3/4 inches, unless otherwise indicated.
- D. Lock Trim:
1. Levers: Forged or Cast.
 2. Escutcheons: Wrought.
 3. Dummy Trim: Match lever lock trim and escutcheons.
 4. "Locked" indicator on interior of all classroom locks.
- E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
 4. Strikes for Mortise Locks and Latches: BHMA A156.13.
- F. Mortise Locks: BHMA A156.13; Operational Grade 1, Security Grade 1; cold-rolled steel case with steel or brass parts; Series 1000.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
 - b. Schlage, an Allegion brand.
 - c. Stanley Commercial Hardware.
 - d. Or Equal.

2.5 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
 1. Grand Master Key System: Change keys, a master key, and a grand master key operate cylinders.
 2. Existing Keying System:
 - a. Master key or grand master key locks to District's existing system. Assume District's existing system is by either Corbin-Russwin, Stanley, or Schlage. Confirm existing key system through RFI process after Contract award. Do not contact District Lock Shop.
 3. New Keying System:
 - a. Provide a new patented and geographically restricted key system that is registered to the San Diego Unified School District.
 - b. New Cylinders: Construction keyed using a removable insert. Remove insert at Substantial Completion.
- B. Keys: Nickel silver.
 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: "DO NOT DUPLICATE."
 2. Quantity: In addition to one extra key blank for each lock, provide the following:
 - a. Cylinder Change Keys: Three.
 - b. Master Keys: Five.
 - c. Grand Master Keys: Five.
 - d. Great-Grand Master Keys: Five.

2.6 KEY CONTROL SYSTEM

- A. Key Control Cabinet: BHMA A156.5, Grade 1; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, 2 sets of key tags with self-locking key holders,

key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of the number of locks.

1. Wall-Mounted Cabinet: Cabinet with hinged-panel door equipped with key-holding panels and pin-tumbler cylinder door lock.
- B. Cross-Index System: Single-index system for recording key information. Include three receipt forms for each key-holding hook. Set up by Installer.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Key Control Systems, Inc.
 - b. Lund Equipment Co., Inc.
 - c. MMF Industries.
 - d. Or Equal.

2.7 OPERATING TRIM

- A. Operating Trim: BHMA A156.6; brass, bronze, or stainless steel, unless otherwise indicated.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ives, an Allegion brand.
 - b. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
 - c. Trimco.
 - d. Or Equal.

2.8 ACCESSORIES FOR PAIRS OF DOORS

- A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.
- B. Carry-Open Bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.
- C. Astragals: BHMA A156.22.

2.9 METAL PROTECTIVE TRIM UNITS

- A. Metal Protective Trim Units: BHMA A156.6; beveled top and sides; fabricated from material indicated in Hardware Sets; with manufacturer's standard machine or self-tapping screw fasteners with oval heads; sized 1-1/2-inch less than door width on push

side of door and 1/2-inch less than door width on pull side of door, by height indicated in Hardware Sets. Plates over 16 inches above finish floor mounted on fire rated doors shall be labeled.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allegion plc.
 - b. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
 - c. Trimco.
 - d. Or Equal.

2.10 MISCELLANEOUS DOOR HARDWARE

- A. Boxed Power Supplies: Modular unit in NEMA ICS 6, Type 4 enclosures; filtered and regulated; voltage rating and type matching requirements of door hardware served; and listed and labeled for use with fire alarm systems.
- B. Concealed Door Switch: Provide each exterior door with two low voltage switches; one switch for intrusion alarm and one switch for HVAC interface on classrooms and administration areas. Mount intrusion alarm switch in header approximately 6 inches from strike side. Mount HVAC interface switch approximately 6 inches to 8 inches from hinge side (dependent on closer mounting hardware).
- C. Dated DoorScore Tags: Include in Hardware Sets for fire and egress doors. Mount on hinge jamb.

2.11 FABRICATION

- A. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not provide manufacturer's standard materials or forming methods if different from specified standard.
- B. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware.
 2. Fire-Rated Applications:

- a. Wood or Machine Screws: For the following:
 - 1) Hinges mortised to doors or frames.
 - 2) Strike plates to frames.
 - 3) Closers to doors and frames.
- b. Steel Through Bolts: For the following unless door blocking is provided:
 - 1) Surface hinges to doors.
 - 2) Closers to doors and frames.
 - 3) Surface-mounted exit devices.
- 3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
- 4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
- 5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.12 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Wood Doors: Comply with DHI A115-W Series.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights indicated on Drawings unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's 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. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
- E. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- F. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with District Construction Manager.
 - 1. Configuration: Provide one power supply for each door opening with electrified door hardware.
- G. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 07 92 00 "Joint Sealants."

- H. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic or more than 4 inches from wall.
- I. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- J. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- K. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
 - 1. With installer present, test door hardware operation with climate control system both at rest and while in full operation.
 - 2. With installer and electrical contractor present, test hardware interfaced with fire/life-safety system for proper operation and release.
 - 3. With installer, access control contractor and electrical contractor present, test electrical and electronic hardware systems for proper operation.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 3. Door Closers: Adjust sweep period to comply with accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train District's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Section 01 79 00 "Demonstration and Training."

3.8 DOOR HARDWARE SCHEDULE

HW SET GH1 DOORS 02 EACH

QNTY	UNIT	ITEM	DESCRIPTION	FIN	MFG
1	EA	FORK LATCH PADLOCK	PADLOCK WITH ACCESSIBLE FORK LATCH AS REQUIRED PER GATE SCHEDULE, DETAILS		B/O

ALL HARDWARE BY GATE MAUFACTURER

MISCELLANEOUS MATERIAL

QNTY	UNIT	ITEM
12	EA	CONSTRUCTION MASTER KEYS
3	EA	CHANGE KEYS PER CYLINDER OR CORE
3	EA	GRANDMASTER KEYS PER GRANDMASTER GROUP
3	EA	MASTER KEYS PER MASTER GROUP
100	EA	EXTRA KEYBLANKS PER KEYWAY
1	EA	BINDER FOR CATALOG CUTS AND HARDWARE SCHEDULE FOR JOB
1	SET	SPECIAL TOOLS, DRIVERS, WRENCHES, ETC.
1	EA	BINDER W/ INSTRUCTIONS, MAINTENANCE, ADJUSTMENT INFORMATION FOR EACH ITEM

END OF SECTION 08 71 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 Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior vertical plasterwork (stucco).
 - 2. Interior vertical plasterwork.

1.3 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION 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.
- C. Samples: For each type of factory-prepared finish coat and for each color and texture specified.
- D. Samples for Initial Selection: For each type of factory-prepared finish coat and for each color and texture specified.
- E. Samples for Verification: For each type of factory-prepared finish coat and for each color and texture specified, 12-by-12 inches, and prepared on rigid backing.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. 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 FIELD CONDITIONS

- A. Comply with ASTM C 926 requirements.
- B. 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 deg F.
 - 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.
- C. Interior Plasterwork: Maintain room temperatures at greater than 40 deg F for at least 48 hours before plaster application, and continuously during and after application.
 - 1. Avoid conditions that result in plaster drying out during curing period. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
 - 2. Ventilate building spaces as required to remove water in excess of that required for hydrating plaster in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.
- D. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. 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.

2.2 METAL LATH

- A. Expanded-Metal Lath: ASTM C 847, cold-rolled carbon-steel sheet with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized-zinc coating.
 - 1. Diamond-Mesh Lath: Self-furring, 3.4 lb/sq. yd..
 - 2. Flat-Rib Lath: Rib depth of not more than 1/8-inch (3-mm), 3.4 lb/sq. yd..

- B. Wire-Fabric Lath:
 - 1. Welded-Wire Lath: ASTM C 933; self-furring, 1.4 lb/sq. yd..
 - 2. Woven-Wire Lath: ASTM C 1032; self-furring, with stiffener wire backing, 1.4 lb/sq. yd..
- C. Paper Backing: FS UU-B-790a, Type I, Grade D, Style 2 vapor-permeable paper.
 - 1. Provide paper-backed lath at exterior locations.
- D. No. 15 Asphalt-Saturated Organic Felt: ASTM D226, Type 1, unperforated.

2.3 ACCESSORIES

- A. General: Comply with ASTM C 1063, ASTM C 1861, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:
 - 1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 zinc coating.
 - 2. External- (Outside-) Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized-zinc coating.
 - 3. Cornerbeads: Fabricated from zinc
 - 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.
 - d. Bullnose cornerbead, radius 3/4-inch minimum, with expanded flanges; use at locations indicated on Drawings.
 - 4. Casing Beads: Fabricated from zinc or zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
 - 5. 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.
 - 6. Expansion Joints: Fabricated from zinc or zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
 - 7. Two-Piece Expansion Joints: Fabricated from zinc or zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4- to 5/8-inch-wide; with perforated flanges.

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. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2-inch long, free of contaminants, manufactured for use in cement plaster.
- C. Bonding Compound: ASTM C 932.
- D. Fasteners for Attaching Metal Lath to Substrates: ASTM C 1861.
- E. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter unless otherwise indicated.
- F. Steel drill screws complying with ASTM C 1002 for fastening metal lath to wood or steel members less than 0.033-inch thick.
- G. Steel drill screws complying with ASTM C 954 for fastening metal lath to steel members 0.033- to 0.11-inch thick.
- H. 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.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

2.5 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I.
 - 1. Color for Finish Coats: White.
- B. Colorants for Job-Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color to match Architect's sample .
- C. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.
- D. Sand Aggregate: ASTM C 897.
 - 1. Color for Job-Mixed Finish Coats: In color matching Architect's sample.
- E. Perlite Aggregate: ASTM C 35.
- F. Ready-Mixed Finish-Coat Plaster: Mill-mixed Portland cement, aggregates, coloring agents, and proprietary ingredients.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Omega Products International.
 - b. LaHabra Stucco Solutions; Parex USA.
 - c. Merlex Stucco.
 - d. Or Equal.
2. Color: As selected by Architect from manufacturer's full range .

2.6 PLASTER MIXES

- A. General: 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. of cementitious materials.
- B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
 1. Portland Cement Mixes:
 - a. Scratch Coat: For cementitious material, mix 1 part Portland cement and 0 to 3/4 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 0 to 3/4 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. Base-Coat Mixes for Use over Concrete: Single base (scratch) coat for two-coat plasterwork on low-absorption plaster bases as follows:
 1. Portland Cement Mix: For cementitious material, mix 1 part Portland cement and 0 to 3/4 part lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
- D. Base-Coat Mixes for Use over Concrete: Single base (scratch) coat for two-coat plasterwork on high-absorption plaster bases as follows:
 1. Portland Cement Mix: 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.
- E. 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.
- F. Factory-Prepared Finish-Coat Mixes: For ready-mixed finish-coat plasters, comply with manufacturer's written instructions.

PART 3 - EXECUTION**3.1 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.

3.2 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 C 926.

3.3 INSTALLATION, GENERAL

- A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.
- B. Sound-Attenuation Blankets: Where required, install blankets before installing lath unless blankets are readily installed after lath has been installed on one side.

3.4 INSTALLING METAL LATH

- A. Metal Lath: Install according to ASTM C 1063.
 1. Partition Framing and Vertical Furring: Install welded-wire lath.
 2. Flat-Ceiling and Horizontal Framing: Install diamond-mesh lath.
 3. Curved-Ceiling Framing: Install welded-wire lath.
 4. On Solid Surfaces, Not Otherwise Furred: Install self-furring, welded-wire lath.

3.5 INSTALLING ACCESSORIES

- A. Install according to ASTM C 1063 and at locations indicated on Drawings.
- B. Reinforcement for External (Outside) Corners:
 - 1. Install lath-type, external-corner reinforcement at exterior locations.
 - 2. Install cornerbead at interior locations.
- C. Control Joints: Locate as approved by Architect for visual effect and as follows:
 - 1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
 - a. Vertical Surfaces: 144 sq. ft.
 - b. Horizontal and Other Nonvertical Surfaces: 100 sq. ft.
 - 2. At distances between control joints of not greater than 18 feet 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.

3.6 PLASTER APPLICATION

- A. General: Comply with ASTM C 926.
 - 1. Do not deviate more than plus or minus 1/4-inch in 10 feet from a true plane in finished plaster surfaces when measured by a 10-foot 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 concrete substrates for direct application of plaster.
- C. Walls; Base-Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three-coat plasterwork with 3/4-inch total thickness, as follows:
 - 1. Portland cement mixes.
- D. Ceilings; Base-Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three-coat plasterwork and having 1/2-inch total thickness, as follows:
 - 1. Portland cement mixes.

- E. Walls; Base-Coat Mix: For base (scratch) coat, for two-coat plasterwork and having 1/4-inch thickness on concrete, as follows:
 - 1. Portland cement mix.
- F. Ceilings; Base-Coat Mix: For base (scratch) coat, for two-coat plasterwork and having 1/4-inch thickness on concrete, as follows:
 - 1. Portland cement mix.
- G. Plaster Finish Coats: Apply to provide 20/30 sand finish to match Architect's sample.
- H. Concealed Exterior Plasterwork: Where plaster application is used as a base for adhered finishes, omit finish coat.
- I. Concealed Interior Plasterwork:
 - 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.

3.7 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.

3.8 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 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 Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Texture finishes.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.
 - 2. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.
- C. Samples for Initial Selection: For each type of trim accessory and textured finish indicated.
- D. Samples for Verification: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.
 - 2. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

GYPSUM BOARD**09 29 00 - 1****KITCHEN MODIFICATIONS GROUP 6**

- B. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- C. Suspended gypsum board ceiling systems shall comply with DSA IR-25-3.13.

2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C 1396/C 1396M.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. National Gypsum Company.
 - b. PABCO Gypsum.
 - c. United States Gypsum Company.
 - d. Or Equal.
 2. Thickness: 5/8-inch.
 3. Long Edges: Tapered.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. National Gypsum Company.
 - b. PABCO Gypsum.
 - c. United States Gypsum Company.
 - d. Or Equal.
 2. Thickness: 5/8-inch.
 3. Long Edges: Tapered.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 2. 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.
 - g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
1. Interior Gypsum Board: Paper.
 2. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.
2. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033- to 0.112-inch thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Isolation Strip at Exterior Walls:

1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.

D. 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.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hilti, Inc.

- b. Pecora Corporation.
- c. United States Gypsum Company.
- d. Or Equal.

F. Thermal Insulation: As specified in Section 07 21 00 "Thermal Insulation."

2.7 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.
- B. Aggregate Finish: Water-based, job-mixed, aggregated, drying-type texture finish for spray application.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. National Gypsum Company.
 - b. PABCO Gypsum.
 - c. United States Gypsum Company.
 - d. Or Equal.
 - 2. Texture: Light spatter.
- C. Non-Aggregate Finish: Premixed, vinyl texture finish for spray application.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. National Gypsum Company.
 - b. PABCO Gypsum.
 - c. United States Gypsum Company.
 - d. Or Equal.
 - 2. Texture: Orange peel.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16-inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.
- J. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge

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trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

- K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:

- 1. Wallboard Type: As indicated on Drawings.
- 2. Type X: As indicated on Drawings.
- 3. Flexible Type: As indicated on Drawings.
- 4. Abuse-Resistant Type: As indicated on Drawings.

- B. Single-Layer Application:

- 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
- 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
- 3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
- 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

- C. Multilayer Application:

- 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
- 2. 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.
- 3. 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.

4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

D. Curved Surfaces:

1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch-long straight sections at ends of curves and tangent to them.
2. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints at locations indicated on Drawings.
- C. Interior Trim: Install in the following locations:
 1. Cornerbead: Use at outside corners.
 2. Bullnose Bead: Use at outside corners.
 3. LC-Bead: Use at exposed panel edges.
 4. L-Bead: Use where indicated.
 5. U-Bead: Use at exposed panel edges.
 6. Curved-Edge Cornerbead: Use at curved openings.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

2. Level 2: Where indicated on Drawings.
3. Level 3: Where indicated on Drawings.
4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."
5. Level 5: Where indicated on Drawings.
 - a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.6 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written instructions.

3.7 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include fuzzy or splotchy surface contamination and discoloration.

SPECIFICATIONS

NO. CP25-1029-52-00-00

END OF SECTION 09 29 00

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**SECTION 09 91 13
EXTERIOR PAINTING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Aluminum (not anodized or otherwise coated).
 - 2. Portland cement plaster (stucco).
- B. Related Requirements:
 - 1. Section-02 83 33 "Removal and Disposal of Material Containing Lead".
 - 2. Section-09 91 23 "Interior Painting".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.4 QUALITY ASSURANCE

- A. Paint Contractor shall have a minimum of five years documented experience in application of paints and coatings specified. Contractor shall maintain qualified painting crews during entire painting process.
- B. Regardless of selected paint manufacturer, Contractor is to provide exact color and gloss to match Architect's selection at no additional cost.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints in rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

- A. Do not provide any extra materials.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. PPG Industries.
 - 2. Sherwin-Williams Company (The).
 - 3. Vista Paint Corporation.
 - 4. Dunn-Edwards Paints.
 - 5. Or Equal.

2.2 PAINT, GENERAL

- A. Do not provide materials that contain substances classified by the Global Hazard System as carcinogenic.
- B. Do not provide materials that contain substances listed in the Significant New Use Rule (SNUR) under Toxic Substances Control Act (TSCA).
- C. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- D. Colors: As selected by Architect from manufacturer's full range.
- E. Material Quality: Provide manufacturer's best quality paint material of the various types specified that are factory formulated and recommended by manufacturer for application indicated. Use only paint material containers displaying manufacturer's product identification.
- F. Regulatory Requirements: Coatings shall comply with the testing and product requirements of San Diego Air Pollution Control District Rule 67.0 "Architectural Coatings."

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: District reserves the right to invoke the following procedure:
 - 1. District will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. District 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.

2.4 BLOCK FILLERS

- A. Exterior Latex Block Filler:

1. Dunn-Edwards Paints; SBSL00 - Smooth Bloc-Fil Select.
2. PPG Paints; SPEEDHIDE® Interior/Exterior Masonry Latex Block Filler 6-15XI.
3. Sherwin-Williams Company; PrepRite B25W25 Block Filler.
4. Vista Paint Corporation; 40 Block Kote.
5. Or Equal.

2.5 PRIMERS/SEALERS

A. Concrete and Masonry Alkali-Resistant Primer:

1. Dunn-Edwards Paints; ESPR00 Eff-Stop Premium.
2. PPG Paints; Perma-Crete Interior/Exterior Alkali Resistant Primer 4-603XI.
3. Sherwin-Williams Company; Loxon Primer A24W8300.
4. Vista Paint Corporation; 4600 Uniprime.
5. Or Equal.

B. Acrylic Bonding Primer (for previously painted or glossy surfaces):

1. Dunn-Edwards Paints; SLPR00 Super-Loc.
2. PPG Paints; Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer, 17-921XI.
3. Sherwin-Williams Company; PrepRite ProBlock B51W8020.
4. Vista Paint Corporation; 4000 Uniprime.
5. Or Equal.

2.6 METAL PRIMERS

A. Acrylic Ferrous Metal Primer:

1. Dunn-Edwards Paints; ENPR00 EnduraPrime.
2. PPG Paints; Pitt Tech Plus 4020PF Primer.
3. Sherwin-Williams Company; ProCryl B66.
4. Vista Paint Corporation; 4800 Metal Pro Acrylic Primer.
5. Or Equal.

B. Acrylic Galvanized and Non-Ferrous Metal Waterborne Primer. (Galvanized metal shall be acid-etched with manufacturer's recommended phosphoric acid solution and rinsed before priming.):

1. Dunn-Edwards Paints; ULGM00 UltraShield Galvanized Metal Primer.
2. PPG Paints; Pitt Tech Plus 4020PF Primer.
3. Sherwin-Williams Company; ProCryl B66.
4. Vista Paint Corporation; 4800 Metal Pro Acrylic Primer.
5. Or Equal.

2.7 WOOD PRIMERS**A. Exterior Latex Wood Primer:**

1. Dunn-Edwards Paints; EZPR00 EZ-Prime Premium.
2. PPG Paints; Seal Grip Interior/Exterior Stain-Killing Primer 17-921.
3. Sherwin-Williams Company; Prep Rite Pro Block B51W8020.
4. Vista Paint Corporation; 4200 Terminator.
5. Or Equal.

2.8 EXTERIOR LATEX PAINTS**A. Exterior Acrylic Latex (Semigloss):**

1. Dunn-Edwards Paints; SSHL50 Sparta Shield Semi Gloss.
2. PPG; 4216 HP Series Pitt-Tech Plus DTM Semigloss.
3. Sherwin-Williams Company; ProIndustrial DTM Acrylic Semigloss B66-1150.
4. Vista Paint Corporation; 8400 Carefree.
5. Or Equal.

B. Exterior Acrylic Latex (Gloss):

1. Dunn-Edwards Paints; SSHL60 Sparta Shield Gloss.
2. PPG; 4216 HP Pitt-Tech Plus DTM Gloss.
3. Sherwin-Williams Company; ProIndustrial DTM Acrylic Gloss, B66-1050.
4. Vista Paint Corporation; 8500 Carefree Gloss.
5. Or Equal.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
 2. Masonry (Clay and CMUs): 12 percent.
 3. Wood: 15 percent.
 4. Portland Cement Plaster: 12 percent.
 5. Gypsum Board: 12 percent.
- C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

- D. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- E. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- F. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances and conditions that could impair bond of paints, including peeling paint, dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Clay Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content of surfaces or alkalinity of mortar joints to be painted exceed that permitted in manufacturer's written instructions.
- F. Concrete 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.
- G. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.

3. SSPC-SP 7/NACE No. 4.
 4. SSPC-SP 11.
- H. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- I. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- J. Exterior Plaster Substrates: Verify that exterior plaster has fully cured.
- K. Aluminum Substrates: Remove surface oxidation per SSPC-SP1.
- L. Exterior Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
- M. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates
- N. Wood Substrates:
1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
 2. Sand surfaces that will be exposed to view, and dust off.
 3. Prime edges, ends, faces, undersides, and backsides of wood.
 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
1. Use applicators and techniques suited for paint and substrate indicated.
 2. Apply paints to meet manufacturer's recommended dry film thickness per coat.
 3. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 4. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 5. Paint entire exposed surface of window frames and sashes.
 6. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 7. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - h. Exterior condensate piping, all exposed exterior conditions whether exposed to view or not.
 - i. .

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: District may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. 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.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

- A. Steel and Iron Substrates:
 - 1. Acrylic System:
 - a. Prime Coat: Acrylic Ferrous Metal Primer.
 - b. Intermediate Coat: Exterior Acrylic Latex.
 - c. Topcoat: Exterior Acrylic Latex.
- B. Aluminum Substrates:
 - 1. Latex System:
 - a. Prime Coat: Acrylic Galvanized and Non-Ferrous Metal Waterborne Primer.
 - b. Intermediate Coat: Exterior Latex, match topcoat.
 - c. Topcoat: Exterior Latex, semigloss.
- C. Portland Cement Plaster Substrates:
 - 1. Latex System
 - a. Prime Coat: Exterior Acrylic Latex.
 - b. Intermediate Coat: Exterior Acrylic Latex.
 - c. Topcoat: Exterior Acrylic Latex, semigloss.

END OF SECTION 09 91 13

**SECTION 09 91 23
INTERIOR PAINTING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Gypsum board.
- B. Related Requirements:
 - 1. Section 02 83 33 "Removal and Disposal of Material Containing Lead".
 - 2. Section 09 91 13 "Exterior Painting".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Indicate VOC content.
- D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- E. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.4 QUALITY ASSURANCE

- A. Paint Contractor shall have a minimum of five years documented experience in application of paints and coatings specified. Contractor shall maintain qualified painting crews during entire painting process.
- B. Regardless of selected paint manufacturer, Contractor is to provide exact color and gloss to match Architect's selection at no additional cost.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

- A. Do not provide any extra materials.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. PPG Industries.
 - 2. Sherwin-Williams Company (The).
 - 3. Vista Paint Corporation.
 - 4. Dunn-Edwards Paints.
 - 5. Or Equal.

2.2 PAINT, GENERAL

- A. Do not provide materials that contain substances classified by the Global Hazard System as carcinogenic.
- B. Do not provide materials that contain substances listed in the Significant New Use Rule (SNUR) under Toxic Substances Control Act (TSCA)
- C. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- D. Colors: As selected by Architect from manufacturer's full range.
- E. Material Quality: Provide manufacturer's best quality paint material of the various types specified that are factory formulated and recommended by manufacturer for application indicated. Use only paint material containers displaying manufacturer's product identification.
- F. Regulatory Requirements: Coatings shall comply with the testing and product requirements of San Diego Air Pollution Control District Rule 67.0 "Architectural Coatings."

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: District reserves the right to invoke the following procedure:
 - 1. District will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. District 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.

2.4 BLOCK FILLERS

- A. Interior/Exterior Latex Block Filler:

1. Dunn-Edwards Paints; SBSL00 Smooth Bloc-Fil Select.
2. PPG Paints; 6-4900 XI Speedhide Zero Interior Zero VOC Latex Sealer.
3. Sherwin-Williams Company; B25W25 Block Filler.
4. Vista Paint Corporation; 40 Block Kote.
5. Or Equal.

2.5 PRIMERS/SEALERS**A. Interior Latex Primer/Sealer for gypsum board:**

1. Dunn-Edwards Paints; VNSL00 Vinylastic Select.
2. PPG Paints; 6-4900 XI Speedhide Zero Interior Zero VOC Latex Sealer.
3. Sherwin-Williams Company; ProMar 200 Zero VOC Primer, B28W2600.
4. Vista Paint Corporation; 5000 V-Pro Primer.
5. Or Equal.

B. Interior Latex Primer/Sealer for concrete, plaster and porous surfaces:

1. Dunn-Edwards Paints; UGPR00 Ultra-Grip Premium.
2. PPG SEAL GRIP; Interior/Exterior Acrylic Universal Primer/Sealer 17-921XI.
3. Sherwin-Williams Company; Prep Rite ProBlock B51W8020.
4. Vista Paint Corporation; 4000 Uniprime.
5. Or Equal.

C. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.**2.6 METAL PRIMERS****A. Acrylic Ferrous Metal Primer:**

1. Dunn-Edwards Paints; ENPR00 EnduraPrime.
2. PPG Paints; Pitt Tech Plus 4020PF Primer.
3. Sherwin-Williams Company; ProCryl B66.
4. Vista Paint Corporation; 4800 Metal Primer.
5. Or Equal.

B. Acrylic Non-Ferrous Metal Primer:

1. Dunn-Edwards Paints; ENPR00 EnduraPrime.
2. PPG Paints; Pitt Tech Plus 4020PF Primer.
3. Sherwin-Williams Company; ProCryl B66
4. Vista Paint Corporation; 4800 Metal Pro Acrylic Metal Primer.
5. Or Equal.

C. Non-Ferrous Metal Pretreatment:

1. Dunn-Edwards Paints; Krud Kutter Metal Clean and Etch.
2. PPG Paints; Krud Kutter Metal Clean and Etch.
3. Sherwin-Williams Company; GLL Clean 'n Etch.
4. Vista Paint Corporation; Jasco Prep 'n Prime.
5. Or Equal.

2.7 ACRYLIC LATEX PAINTS**A. Interior Acrylic Latex (Eggshell):**

1. Dunn-Edwards Paints; SWLL30 Sparta Wall Eggshell.
2. PPG Paint; 6-4310xi Speedhide Zero VOC Eggshell.
3. Sherwin-Williams Company; ProMar 200 Zero VOC Eggshell B20W2600.
4. Vista Paint Corporation; 8300 Carefree.
5. Or Equal.

B. Interior Acrylic Latex (Low Sheen):

1. Dunn-Edwards Paints; SWLL40 Sparta Wall Low Sheen.
2. PPG Paints; 9-300XI PURE PERFORMANCE® Interior Latex Eggshell.
3. Sherwin-Williams Company; ProMar 200 Zero VOC Low Sheen, B24-2600.
4. Vista Paint Corporation; 8200 Carefree Velvasheen
5. Or Equal.

C. Interior Acrylic Latex (Semigloss):

1. Dunn-Edwards Paints; SWLL50 Sparta Wall Semi Gloss.
2. PPG Paints; 4216 HP Series Pitt-Tech Plus Interior/Exterior high performance waterborne Semi-Gloss DTM Enamel.
3. Sherwin-Williams Company; ProIndustrial DTM Acrylic Semigloss B66-1150.
4. Vista Paint Corporation; 8400 Carefree.
5. Or Equal.

D. Interior Acrylic Latex (Gloss):

1. Dunn-Edwards Paints; ASHL70 AristoShield.
2. PPG; 4216 HP Series Pitt-Tech Plus Interior/Exterior high performance waterborne Gloss DTM Enamel.
3. Sherwin-Williams Company; ProIndustrial DTM Acrylic Gloss B66-1050.
4. Vista Paint Corporation; 8500 Carefree.
5. Or Equal.

E. Institutional Low-Odor/VOC Latex (Eggshell):

1. Dunn-Edwards Paints; SWLL30 SpartaWall Eggshell.
2. PG Paints: 6-4310xi Speedhide Zero VOC Eggshell.
3. Sherwin-Williams Company; ProMar 200 Zero VOC Eggshell B20-2600.
4. Vista Paint Corporation; 5300 V-Pro Eggshell.

5. Or Equal.

F. Institutional Low-Odor/VOC Latex (Semigloss):

1. Dunn-Edwards Paints; SWLL50 SpartaWall Semi Gloss.
2. PPG Paints; 6-4510xi Speedhide ZERO VOC Semi-Gloss.
3. Sherwin-Williams Company; ProMar 200 Zero VOC Semigloss B31-2600.
4. Vista Paint Corporation; 5400 V-Pro Semi-gloss.
5. Or Equal.

2.8 FLOOR COATINGS

A. Interior/Exterior Clear Concrete Floor Sealer (Water Based):

1. Dunn-Edwards Paints; OKN-06 Okon Seal and Finish.
2. PPG Paints; Perma-Crete PLEX-SEAL® WB Interior/Exterior Clear Sealer 4-6200X.
3. Sherwin-Williams Company; H&C WL Sealer.
4. Vista Paint Corporation; Monpole Aquaseal SS.
5. Or Equal.

B. Latex Floor Enamel (Non-skid, low gloss):

1. Dunn-Edwards Paints; Desert Brand CMFPS.
2. PPG Paints; ROC-18 Rust-Oleum Porch + Floor.
3. Sherwin-Williams Company; Armorseal Tread-plex B90W111.
4. Vista Paint Corporation; Acripoxy 400.
5. Or Equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
 2. Fiber-Cement Board: 12 percent.
 3. Concrete Masonry: 12 percent.
 4. Wood: 15 percent.
 5. Gypsum Board: 12 percent.
 6. Plaster: 12 percent.

- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Plaster Substrates: Verify that plaster is fully cured.
- E. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
- F. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- G. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including peeling paint, dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer[.] [**but not less than the following:**]
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 11.

- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue, per SSPC-SP1, from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- J. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry, sanded smooth, and dust free. Sand hard, slick, previously painted surfaces and remove all sanding dust.
- K. Plaster Substrates: Do not begin paint application until plaster is fully cured and dry.
- L. Spray-Textured Ceiling Substrates: Do not begin paint application until surfaces are dry.
- M. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
 - 2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: District may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. 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.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Interior Latex Primer/Sealer for concrete, plaster and porous surfaces.
 - b. Intermediate Coat: Interior Acrylic Latex.
 - c. Topcoat: Interior Acrylic Latex, eggshell.
- B. Concrete Substrates, Traffic Surfaces:
 - 1. Latex Floor Enamel System:
 - a. Prime Coat: Latex Floor Enamel.
 - b. Topcoat: Latex Floor Enamel.
 - 2. Water-Based Clear Sealer System:
 - a. Prime Coat: Interior/Exterior clear concrete floor sealer (water based).
 - b. Topcoat: Interior/Exterior clear concrete floor sealer (water based).
- C. Steel Substrates:
 - 1. Latex System:
 - a. Prime Coat: Acrylic Ferrous Metal Primer.
 - b. Intermediate Coat: Primer, Interior Acrylic Latex.
 - c. Topcoat: Interior Acrylic Latex, eggshell.
- D. Galvanized-Metal and Non-Ferrous Substrates:
 - 1. Latex System:
 - a. Pretreatment: Non-Ferrous Metal Pretreatment.
 - b. Prime Coat: Acrylic Non-Ferrous Metal Primer.
 - c. Topcoat: Two coats of Interior Acrylic Latex, eggshell.
- E. Spray-Textured Ceiling Substrates:
 - 1. Latex, (Flat) System:

- a. Prime Coat: Interior Latex Primer/Sealer appropriate for surface.
- b. Topcoat: Latex Dry Fog/Fall.

F. Gypsum Board Substrates:

1. Institutional Low-Odor/VOC Latex System:

- a. Prime Coat: Interior Latex Primer/Sealer for gypsum board.
- b. Intermediate Coat: Interior Acrylic Latex.
- c. Top Coat: Interior Acrylic Latex, eggshell.

G. Plaster Substrates:

1. Institutional Low-Odor/VOC Latex System:

- a. Prime Coat: Interior Latex Primer/Sealer for concrete, plaster and porous surfaces.
- b. Intermediate Coat: Interior Acrylic Latex.
- c. Top Coat: Interior Acrylic Latex, eggshell.

END OF SECTION 09 91 23

**SECTION 23 07 19
HVAC PIPING 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 insulating the following HVAC piping systems:
 - 1. Condensate drain piping, indoors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.5 COORDINATION

- A. Coordinate installation and testing of heat tracing.

1.6 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation applications may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS**2.1 INSULATION MATERIALS**

- A. Comply with 2019 Title 24 Building Energy Efficiency Standards
 - 1. Heating and Hot Water Piping: Section 503.7.3(1), Table E.
 - 2. Cooling Systems: Section 503.7.3(2), Table E.
 - 3. Prior to insulating pipes, confirm piping temperature with manufacturer.
- B. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- C. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- D. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- E. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

2.3 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
 - 1. Mastics shall comply with the testing and product requirements of San Diego Air Pollution Control District Rule 67.0 "Architectural Coatings" and Rule 67.21 "Adhesive Material Application Operations."
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
 - 1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 - 2. Service Temperature Range: Minus 20 to plus 180 deg F.
 - 3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 - 4. Color: White.
- C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below-ambient services.

1. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
2. Service Temperature Range: 0 to 180 deg F.
3. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
4. Color: White.

- D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below-ambient services.

1. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
2. Service Temperature Range: Minus 50 to plus 220 deg F.
3. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
4. Color: White.

- E. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.

1. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
2. Service Temperature Range: Minus 20 to plus 180 deg F.
3. Solids Content: 60 percent by volume and 66 percent by weight.
4. Color: White.

2.4 LAGGING ADHESIVES

- A. Description: Comply with MIL-A-3316C, Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.

1. Lagging adhesive shall comply with the testing and product requirements of San Diego Air Pollution Control District Rule 67.0 "Architectural Coatings" and Rule 67.21 "Adhesive Material Application Operations."
2. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.
3. Service Temperature Range: 0 to plus 180 deg F.
4. Color: White.

2.5 SEALANTS

- A. Joint Sealants:

1. Joint Sealants for Cellular-Glass Products:
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Permanently flexible, elastomeric sealant.
4. Service Temperature Range: Minus 100 to plus 300 deg F.
5. Color: White or gray.
6. Sealants shall comply with the testing and product requirements of San Diego Air Pollution Control District Rule 67.0 "Architectural Coatings."

2.6 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
 - 1. Width: 3 inches.
 - 2. Thickness: 11.5 mils.
 - 3. Adhesion: 90 ounces force/inch in width.
 - 4. Elongation: 2 percent.
 - 5. Tensile Strength: 40 lbf/inch in width.
 - 6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
- B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
 - 1. Width: 3 inches.
 - 2. Thickness: 6.5 mils.
 - 3. Adhesion: 90 ounces force/inch in width.
 - 4. Elongation: 2 percent.
 - 5. Tensile Strength: 40 lbf/inch in width.
 - 6. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.
- C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
 - 1. Width: 2 inches.
 - 2. Thickness: 6 mils.
 - 3. Adhesion: 64 ounces force/inch in width.
 - 4. Elongation: 500 percent.
 - 5. Tensile Strength: 18 lbf/inch in width.
- D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
 - 1. Width: 2 inches.
 - 2. Thickness: 3.7 mils.
 - 3. Adhesion: 100 ounces force/inch in width.
 - 4. Elongation: 5 percent.
 - 5. Tensile Strength: 34 lbf/inch in width.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
 1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
 2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Keep insulation materials dry during application and finishing.

- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- H. Install insulation with least number of joints practical.
- I. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- J. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- K. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- L. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- M. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.4 PENETRATIONS

- A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- B. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

3.5 INDOOR PIPING INSULATION SCHEDULE

- A. Condensate and Equipment Drain Water below 60 Deg F:

END OF SECTION 23 07 19

**SECTION 23 21 13
HYDRONIC PIPING****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 pipe and fitting materials and joining methods for the following:
 - 1. Copper tube and fittings.
 - 2. Joining materials.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of the following:
 - 1. Pipe.
 - 2. Fittings.
 - 3. Joining materials.

PART 2 - PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
 - 1. Condensate Drain Piping: 60 deg F.

2.2 COPPER TUBE AND FITTINGS

- A. Drawn-Temper Copper Tubing: ASTM B 88, Type M.

2.3 JOINING MATERIALS

- A. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

PART 3 - EXECUTION**3.1 PIPING APPLICATIONS**

- A. Condensate-Drain Piping: Type M, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

3.2 PIPING INSTALLATIONS

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping at indicated slopes.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Install piping to allow application of insulation.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

- K. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
- L. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- M. Install sleeves for piping penetrations of walls, ceilings, and floors.
- N. Install sleeve seals for piping penetrations of concrete walls and slabs.

3.3 PIPE JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

END OF SECTION 23 21 13

SECTION 26 05 19**LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

- A. VFC: Variable frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent company, with the experience and capability to conduct the testing indicated, that is a member company of the National Electrical Testing Association (NETA) or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**26 05 19 - 1****KITCHEN MODIFICATIONS GROUP 6**

1. Testing Agency's Field Supervisor: Person currently certified by the National Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

PART 2 - PRODUCTS**2.1 CONDUCTORS AND CABLES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Cerro Wire LLC.
 2. General Cable; General Cable Corporation.
 3. Southwire Company.
 4. Or Equal.
- B. Copper Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- C. Conductor Insulation:
 1. Type THHN and Type THWN-2: Comply with UL 83.
 2. Type XHHW-2: Comply with UL 44.
- D. VFC Cable:
 1. Comply with UL 1277, UL 1685, and CEC for Type TC-ER cable.
 2. Comply with UL requirements for cables in Classes I and II, Division 2 hazardous location applications.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. 3M.
 2. Ideal Industries, Inc.
 3. O-Z/Gedney; a brand of Emerson Industrial Automation.
 4. Or Equal.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**26 05 19 - 2****KITCHEN MODIFICATIONS GROUP 6**

- B. Comply with CEC.

PART 3 - EXECUTION**3.1 CONDUCTOR MATERIAL APPLICATIONS**

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. VFC Output Circuit Cables: Extra-Flexible stranded for all sizes.

3.2 CONDUCTOR INSULATION AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway.
- B. Exposed Feeders: Type XHHW-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type XHHW-2, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.
- E. Feeders Installed below Raised Flooring: Type XHHW-2, single conductors in raceway.
- F. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- G. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.
- H. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.
- I. Branch Circuits Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway.
- J. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- K. VFC Output Circuits: Type XHHW-2 in metal conduit.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, which will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 26 05 53 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

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3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 07 84 13 "Penetration Firestopping."

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform the following tests and inspections.
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors and conductors feeding critical equipment and services for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
 - b. Test bolted connections for high resistance using one of the following:
 - 1) A low-resistance ohmmeter.
 - 2) Calibrated torque wrench.
 - 3) Thermographic survey.
 - c. Inspect compression applied connectors for correct cable match and indentation.
 - d. Inspect for correct identification.
 - e. Inspect cable jacket and condition.
 - f. Insulation-resistance test on each conductor with respect to ground and adjacent conductors. Apply a potential of 1000-V dc for 600-V rated cable for a one-minute duration.
 - g. Continuity test on each conductor and cable.
 - h. Uniform resistance of parallel conductors.
 - 3. Initial Infrared Scanning: After Substantial Completion, but before Final Completion, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
 - a. Instrument: Use an infrared scanning device designed to measure the temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - b. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

- B. Cables will be considered defective if they do not pass tests and inspections.
- C. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.
 - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION 26 05 19

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SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment, plus the following special applications:
 - 1. Underground distribution grounding.
 - 2. Foundation steel electrodes.
 - 3. Relocatable buildings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
 - 1. Ground rods.
 - 2. Ground rings.
- B. Qualification Data: For testing agency and testing agency's field supervisor.
- C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:

- a. Instructions for periodic testing and inspection of grounding features at ground rings and grounding connections for separately derived systems based on NFPA 70B and EIA/TIA 607.
 - 1) Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
 - 2) Include recommended testing intervals.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Certified by NETA.
 - 1. Testing Agency's Field Supervisor: Certified by NETA.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Burndy; Part of Hubbell Electrical Systems.
 - 2. ILSCO.
 - 3. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - 4. Or Equal.

2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.

3. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 5. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
- E. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- F. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- G. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.
- H. Conduit Hubs: Mechanical type, terminal with threaded hub.
- I. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hexagon head bolt.
- J. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.
- K. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.
- L. Straps: Solid copper, copper lugs. Rated for 600 A.
- M. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.
- N. Water Pipe Clamps:

1. Mechanical type, two pieces with zinc-plated bolts.
 - a. Material: Die-cast zinc alloy.
 - b. Listed for direct burial.
2. U-bolt type with malleable-iron clamp and copper ground connector.

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet.
- B. Chemical-Enhanced Grounding Electrodes: Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts.
 1. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches long.
 2. Backfill Material: Electrode manufacturer's recommended material.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.
 1. Bury at least 24 inches below grade.
 2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.
- C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.
- D. Conductor Terminations and Connections:
 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 3. Connections to Ground Rods at Test Wells: Bolted connectors.
 4. Connections to Structural Steel: Welded connectors.

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5. Connections to Metallic Ramps: Point of connection shall be on the ramp legs under the ramps.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, stranded copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.
- C. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install stranded copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.4 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by CEC:
 1. Feeders and branch circuits.
 2. Lighting circuits.
 3. Receptacle circuits.
 4. Single-phase motor and appliance branch circuits.
 5. Three-phase motor and appliance branch circuits.
 6. Flexible raceway runs.
 7. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

8. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
 9. Transformers.
 10. Switchboards.
 11. Green insulated conductor from service entrance ground bar to TMGB located in MDF room sized per the requirements of TIA/EIA 607B latest revision.
- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- D. Water Heater Cables: Install a separate insulated equipment grounding conductor to each electric water heater cable. Bond conductor to heater units, piping, connected equipment, and components.
- E.
- F. Metallic Fences: Comply with requirements of IEEE C2.
1. Grounding Conductor: Bare, tinned copper, not less than No. 8 AWG.
 2. Gates: Shall be bonded to the grounding conductor with a flexible bonding jumper.
 3. Barbed Wire: Strands shall be bonded to the grounding conductor.

3.5 FENCE GROUNDING

- A. Fence Grounding: Install at maximum intervals of 1500 feet (450 m) except as follows:
1. Fences within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet.
 - a. Gates and Other Fence Openings: Ground fence on each side of opening.
 - 1) Bond metal gates to gate posts.
 - 2) Bond across openings, with and without gates, except at openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches (460 mm) below finished grade.
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet (45 m) on each side of crossing.
- C. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.

- D. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches (150 mm) below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- E. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.

3.6 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- E. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.
- G. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.
- H. Grounding for Relocatable Buildings: Provide ground rods and grounding conductor to effectively ground the relocatable building.
- I. All metallic ramps, landings, stairs, and handrails not attached to permanent building structural steel shall be permanently bonded and grounded.
- J. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column, extending around the perimeter of building or the area or item indicated.
1. Install tinned-copper conductor not less than No. 2/0 AWG for ground ring and for taps to building steel.
 2. Bury ground ring not less than 24 inches from building's foundation.
- K. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to CEC; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
 2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.
 3. Concrete shall be in direct contact with the earth. Concrete installed with insulation, vapor barriers, films, or similar items separating the concrete from the earth is not considered to be in "direct contact" with the earth.
- 3.7 FIELD QUALITY CONTROL
- A. Testing Agency: Engage a qualified testing agency to perform the following tests and inspections.
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.

2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- B. Grounding system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Report measured ground resistances that exceed the following values:
 1. Power and Lighting Equipment or System with Capacity of 500 kVA and less: 25 ohms.
 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 25 ohms.
 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 25 ohms.
 4. Power Distribution Units or Panelboards Serving Electronic Equipment: 25 ohms.
 5. Substations and Pad-Mounted Equipment: 25 ohms.
 6. Manhole Grounds: 25 ohms.
 7. Irrigation Controllers Grounds: 10 ohms.
- E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify District Construction Manager promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

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SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel slotted support systems.
 - 2. Aluminum slotted support systems.
 - 3. Conduit and cable support devices.
 - 4. Support for conductors in vertical conduit.
 - 5. Structural steel for fabricated supports and restraints.
 - 6. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
 - 7. Fabricated metal equipment support assemblies.
- B. Related Requirements:
 - 1. Section 26 05 48.16 "Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Slotted support systems, hardware, and accessories.
 - b. Clamps.
 - c. Hangers.
 - d. Sockets.
 - e. Eye nuts.
 - f. Fasteners.
 - g. Anchors.
 - h. Saddles.
 - i. Brackets.
 - 2. Include rated capacities and furnished specialties and accessories.

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- B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.
 - 1. Hangers. Include product data for components.
 - 2. Slotted support systems.
 - 3. Equipment supports.
 - 4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment.

1.4 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Data: Certificates, for hangers and supports for electrical equipment and systems, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- B. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M.
 - 2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified."
 - 2. Component Importance Factor: 1.0.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches on center in at least one surface.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit; a part of Atkore International.
 - b. G-Strut.
 - c. Unistrut; Part of Atkore International.
 - d. Or Equal
 - 2.
 - 3. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
 - 4. Material for Channel, Fittings, and Accessories: Galvanized steel.
 - 5. Channel Width: Selected for applicable load criteria.
 - 6. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 7. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hilti, Inc.
 - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Or Equal.

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2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened Portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hilti, Inc.
 - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Or Equal.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 05 50 00 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 1. NECA 1.
- B. Comply with requirements in Section 07 84 13 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- C. Comply with requirements for raceways and boxes specified in Section 26 05 33 "Raceways and Boxes for Electrical Systems."

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- D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, and RMC as required by CEC. Minimum rod size shall be 1/4 inch in diameter.
- E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with single-bolt conduit clamps.
- F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, according to CEC.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 - 6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
 - 7. To Light Steel: Sheet metal screws.
 - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to

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substrate by means that comply with seismic-restraint strength and anchorage requirements.

- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Section 05 50 00 "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 03 30 00 "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base as follows:
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

- A. Touchup: Comply with requirements in Section 09 91 13 "Exterior Painting", Section 09 91 23 "Interior Painting" for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

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SECTION 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal conduits, tubing, and fittings.
 - 2. Nonmetal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Nonmetal wireways and auxiliary gutters.
 - 5. Surface raceways.
 - 6. Boxes, enclosures, and cabinets.
 - 7. Handholes and boxes for exterior underground cabling.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. GRC: Galvanized rigid steel conduit.
- D. LFMC: Liquid-tight flexible metal conduit.
- E. RNC: Rigid non-metallic conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.5 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

PART 2 - PRODUCTS**2.1 METAL CONDUITS, TUBING, AND FITTINGS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allied Tube & Conduit; a part of Atkore International.
 - 2. Western Tube and Conduit Corporation.
 - 3. Wheatland Tube Company.
 - 4. Or Equal.
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
 - 1. Comply with NEMA RN 1.
 - 2. Coating Thickness: 0.040 inch, minimum.
- E. EMT: Comply with ANSI C80.3 and UL 797.
- F. FMC: Comply with UL 1; zinc-coated steel.
- G. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and CEC.
 - 2. Fittings for EMT:
 - a. Material: Die cast or steel.
 - b. Type: Compression.
 - 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. CANTEX INC.
 2. Carlon; ABB Group.
 3. Kraloy.
 4. Or Equal.
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- D. LFNC: Comply with UL 1660.
- E. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
- F. Fittings for LFNC: Comply with UL 514B.
- G. Solvent cements and adhesive shall comply with the testing and product requirements of San Diego Air Pollution Control District Rule 67.0 "Architectural Coatings" and Rule 67.21 "Adhesive Material Application Operations."

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. B-line, an Eaton business.
 2. Hoffman; a brand of Pentair Equipment Protection.
 3. Square D.
 4. Or Equal.
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to CEC.
 1. Metal wireways installed outdoors shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

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- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Screw-cover type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allied Moulded Products, Inc.
 - 2. Hoffman; a brand of Pentair Equipment Protection.
 - 3. Lamson & Sessions.
 - 4. Or Equal.
- B. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- C. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.
- D. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.
- E. Solvent cements and adhesive primers shall comply with the testing and product requirements of San Diego Air Pollution Control District Rule 67.0 "Architectural Coatings" and Rule 67.21 "Adhesive Material Application Operations."

2.5 SURFACE RACEWAYS

- A. Listing and Labeling: Surface raceways shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Prime coated, ready for field painting.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Panduit Corp.
 - c. Wiremold / Legrand.

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d. Or Equal.

2.6 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Hoffman; a brand of Pentair Equipment Protection.
 - 2. Hubbell Incorporated.
 - 3. RACO; Hubbell.
 - 4. Or Equal.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Metal Floor Boxes:
 - 1. Material: Cast metal or sheet metal.
 - 2. Type: Fully adjustable.
 - 3. Shape: Rectangular.
 - 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- G. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.
 - 1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- J. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

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- K. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- L. Gangable boxes are allowed.
- M. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- N. Cabinets:
 - 1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.

2.7 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
 - 1. Boxes and handholes for use in underground systems shall be designed and identified as defined in CEC, for intended location and application.
 - 2. Boxes installed in wet areas shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armorcast Products Company.
 - b. NewBasis.
 - c. Oldcastle Precast, Inc.
 - d. Or Equal.
 - 2. Standard: Comply with SCTE 77.
 - 3. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
 - 4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 - 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

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6. Cover Legend: Molded lettering, "ELECTRIC."
7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
8. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC.
2. Concealed Conduit, in masonry or poured-in-place concrete walls, aboveground: RNC, Type EPC-40-PVC.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried (unless otherwise noted).
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
6. Application of Handholes and Boxes for Underground Wiring:
 - a. Handholes and Pull Boxes in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Non-deliberate Loading by Heavy Vehicles: Polymer concrete SCTE 77, Tier 15 structural load rating.
 - b. Handholes and Pull Boxes in Sidewalk and Similar Applications with a Safety Factor for Non-deliberate Loading by Vehicles: Polymer-concrete units, SCTE 77, Tier 8 structural load rating.
 - c. Handholes and Pull Boxes Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin structurally tested according to SCTE 77 with 3000-lbf vertical loading

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Above 8'-0", Not Subject to Physical Damage: EMT.
2. Exposed, At 8'-0" or Below, Not Subject to Severe Physical Damage: GRC.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - d. Gymnasiums.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.

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5. Concealed Conduit, in masonry or poured in place concrete walls: RNC, Type EPC-40-PVC.
 6. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 7. Damp or Wet Locations: GRC.
 8. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 3. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install surface raceways only where indicated on Drawings.
- F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with CEC limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 1 inch of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by District Construction Manager for each specific location.
 - 5. Transition from PVC elbows embedded in concrete slabs to exposed ridged conduit shall be with approved fittings and within 3 inches of finished slab or grade.
- J. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT or GRC for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- M. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- N. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- O. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

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- P. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- Q. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- R. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- S. Surface Raceways:
 - 1. Install surface raceway with a minimum 2-inch radius control at bend points.
 - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- T. Install raceway sealing fittings at accessible locations according to CEC and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to CEC.
- U. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by CEC.
- V. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- W. Expansion-Joint Fittings:
 - 1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground GRC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
 - 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.

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- b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
 - d. Attics: 135 deg F temperature change.
- 3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
- 4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
- 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- X. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations.
- Y. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA and CBC accessibility requirements. Install boxes with height measured to top of box for control devices and to the bottom of box for receptacles and convenience devices, unless otherwise indicated.
- Z. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- AA. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- BB. Locate boxes so that cover or plate will not span different building finishes.
- CC. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- DD. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- EE. Set metal floor boxes level and flush with finished floor surface.

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3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.4 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 05 33

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SECTION 26 05 44**SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
 - 2. Grout.
 - 3. Silicone sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS**2.1 SLEEVES**

- A. Wall Sleeves:
 - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
 - 2. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40 for below grade only.
- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.
- C. Sleeves for Rectangular Openings:
 - 1. Material: Galvanized sheet steel.
 - 2. Minimum Metal Thickness:

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- a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
- b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 07 92 00 "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall, so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
 - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

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1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

END OF SECTION 26 05 44

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SECTION 26 05 48.16
SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Restraint channel bracings.
 - 2. Restraint cables.
 - 3. Seismic-restraint accessories.
 - 4. Mechanical anchor bolts.
 - 5. Adhesive anchor bolts.
- B. Related Requirements:
 - 1. Section 26 05 29 "Hangers and Supports for Electrical Systems" for commonly used electrical supports and installation requirements.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
 - a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by OSHPD or another agency acceptable to authorities having jurisdiction.
 - b. Annotate to indicate application of each product submitted and compliance with requirements.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, and that is acceptable to authorities having jurisdiction.
- B. Comply with seismic-restraint requirements in the CBC unless requirements in this Section are more stringent.
- C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis. They shall bear anchorage preapproval, showing maximum seismic-restraint ratings, by OSHPD or another agency acceptable to authorities having jurisdiction. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) that support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
- D. Comply with CEC.

PART 2 - PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. Seismic-Restraint Loading:
 - 1. Site Class as Defined in the CBC: D.
 - 2. Assigned Seismic Use Group or Building Category as Defined in the CBC: III.
 - a. Component Importance Factor: 1.25.
 - b. Component Response Modification Factor: as applicable per ASCE 7-16.
 - c. Component Amplification Factor: as applicable per ASCE 7-16.
 - 3. Design Spectral Response Acceleration at Short Periods (0.2 Second): 1.181.
 - 4. Design Spectral Response Acceleration at 1.0-Second Period: 0.412.

2.2 RESTRAINT CHANNEL BRACINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. B-line, an Eaton business.
 - 2. Hilti, Inc.
 - 3. Mason Industries, Inc.

4. Or Equal.

- B. Description: MFMA-4, shop- or field-fabricated bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end, with other matching components, and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.3 RESTRAINT CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Kinetics Noise Control, Inc.
2. Mason Industries, Inc.
3. Vibration Mountings & Controls, Inc.
4. Or Equal.

- B. Restraint Cables: ASTM A 492 stainless-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement.

2.4 SEISMIC-RESTRAINT ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. B-line, an Eaton business.
2. Kinetics Noise Control, Inc.
3. Mason Industries, Inc.
4. Or Equal.

- B. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to rigid channel bracings and restraint cables.

- C. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchor bolts and studs.

- D. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices used.

- E. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

2.5 MECHANICAL ANCHOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. B-line, an Eaton business.
 - 2. Hilti, Inc.
 - 3. Mason Industries, Inc.
 - 4. Or Equal.
- B. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.6 ADHESIVE ANCHOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Hilti, Inc.
 - 2. Kinetics Noise Control, Inc.
 - 3. Mason Industries, Inc.
 - 4. Or Equal.
- B. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing PVC or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by OSHPD or another agency acceptable to authorities having jurisdiction.
- B. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 03 30 00 "Cast-in-Place Concrete."
- B. Equipment and Hanger Restraints:
 - 1. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
 - 2. Install seismic-restraint devices using methods approved by OSHPD or another agency acceptable to authorities having jurisdiction providing required submittals for component.
- C. Install cables so they do not bend across edges of adjacent equipment or building structure.
- D. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- E. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- F. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.

4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where connection is terminated to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage qualified testing agency to perform tests and inspections.
- B. Tests and Inspections:
 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 2. Schedule test with the Project Inspector before connecting anchorage device to restrained component (unless post-connection testing has been approved), and with at least seven days' advance notice.
 3. Obtain Project Inspector's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 4. Test at least four of each type and size of installed anchors and fasteners selected by the Project Inspector.
 5. Test to 90 percent of rated proof load of device.
- C. Seismic controls will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 26 05 48.16

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SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels, including arc-flash warning labels.
 - 8. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.
- B. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.
- C. Arc-flash hazard analysis.

PART 2 - PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. Comply with ASME A13.1 and IEEE C2
- B. Comply with CEC.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Comply with CEC and Section 26 05 73.19 "Arc-Flash Hazard Analysis" requirements for arc-flash warning labels.
- F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- B. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeders, and branch-circuit conductors.
 - 1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG.
 - 2. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - 3. Colors for 240-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - 4. Colors for 480/277-V Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.

- c. Phase C: Yellow.
 - 5. Color for Neutral: White.
 - 6. Color for Equipment Grounds: Green.
 - 7. Colors for Isolated Grounds: Green with white stripe.
- C. Raceways and Cables Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."
- D. Warning Label Colors:
 - 1. Identify system voltage with black letters on an orange background.
- E. Warning labels and signs include:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.3 LABELS

- A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. emedco.
 - c. Panduit Corp.
 - d. Or Equal.
- B. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Marking Services, Inc.
 - c. Panduit Corp.

- d. Or Equal.
 - C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil- (0.08-mm-) thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. emedco.
 - c. Panduit Corp.
 - d. Or Equal
 - 2. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized to fit the raceway diameter, such that the clear shield overlaps the entire printed legend.
 - 3. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.
 - D. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. emedco.
 - c. Panduit Corp.
 - d. Or Equal.
 - 2. Minimum Nominal Size:
 - a. 1-1/2 by 6 inches for raceway and conductors.
 - b. 3-1/2 by 5 inches for equipment.
- 2.4 BANDS AND TUBES:
- A. Snap-around, Color-Coding Bands: Slit, pretension, flexible, solid-colored acrylic sleeves, and 2 inches long, with diameters sized to suit diameters and that stay in place by gripping action.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Marking Services, Inc.
 - c. Panduit Corp.

d. Or Equal

B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameters of and shrunk to fit firmly around cables they identify. Full shrink recovery occurs at a maximum of 200 degree F. Comply with UL 224.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Brady Corporation.
- b. Marking Services, Inc.
- c. Panduit Corp.
- d. Or Equal

2.5 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Ideal Industries, Inc.
- b. Marking Services, Inc.
- c. Panduit Corp.
- d. Or Equal

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Brady Corporation.
- b. emedco.
- c. Marking Services, Inc.
- d. Or Equal

C. Floor Marking Tape: 2-inch- wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Carlton Industries, LP.
- b. emedco.

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- c. Seton Identification Products.
 - d. Or Equal
- D. Underground-Line Warning Tape
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Ideal Industries, Inc.
 - c. Marking Services, Inc.
 - d. Or Equal.
 - 2. Tape:
 - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
 - 3. Color and Printing:
 - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
 - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
 - c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".
 - 4. Warning Tape Type:
 - a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, compounded for direct-burial service.
 - b. Width: 3 inches.
 - c. Overall Thickness: 5 mils.
 - d. Foil Core Thickness: 0.35 mil.
 - e. Weight: 28 lb/1000 sq. ft..
 - f. Tensile according to ASTM D 882: 70 lbf and 4600 psi.
- E. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

2.6 TAGS

- A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. emedco.
 - c. Seton Identification Products.
 - d. Or Equal
- B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. emedco.
 - c. Panduit Corp.
 - d. Or Equal

2.7 SIGNS

- A. Baked-Enamel Signs:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlton Industries, LP.
 - b. emedco.
 - c. Marking Services, Inc.
 - d. Or Equal
 - 2. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 - 3. 1/4-inch grommets in corners for mounting.
 - 4. Nominal Size: 7 by 10 inches.
- B. Metal-Backed Butyrate Signs:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Brady Corporation.
 - b. emedco.
 - c. Marking Services, Inc.
 - d. Or Equal
 2. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch galvanized-steel backing and with colors, legend, and size required for application.
 3. 1/4-inch grommets in corners for mounting.
 4. Nominal Size: 10 by 14 inches.
- C. Laminated Acrylic or Melamine Plastic Signs:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. emedco.
 - c. Marking Services, Inc.
 - d. Or Equal
 2. Engraved legend.
 3. Thickness:
 - a. For signs up to 20 sq. inches, minimum 1/16-inch-.
 - b. For signs larger than 20 sq. inches, 1/8 inch thick.
 - c. Engraved legend with black letters on white face.
 - d. Self-adhesive.
 - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.8 CABLE TIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ideal Industries, Inc.
 2. Marking Services, Inc.
 3. Panduit Corp.
 4. Or Equal
- B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
 3. Temperature Range: Minus 40 to plus 185 deg F.

4. Color: Black, except where used for color-coding.
- C. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
 3. Temperature Range: Minus 40 to plus 185 deg F.
 4. Color: Black.
- D. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.
1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F according to ASTM D 638: 7000 psi.
 3. UL 94 Flame Rating: 94V-0.
 4. Temperature Range: Minus 50 to plus 284 deg F.
 5. Color: Black.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.

- C. Verify identity of each item before installing identification products.
- D. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- G. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
- H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- I. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.
- J. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- K. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- L. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

3.3 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

- C. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil. Stencil legend "DANGER - CONCEALED HIGH-VOLTAGE WIRING" with 3-inch- (75-mm-) high, black letters on 20-inch (500-mm) centers.
- D. Accessible Raceways, More Than 600 V: Self-adhesive labels.
1. Locate identification at changes in direction, at penetrations of walls and floors, at 20-foot maximum intervals in straight runs, and at 15-foot maximum intervals in congested areas.
- E. Accessible Raceways, 600 V or Less, for Service, Feeder, and Branch Circuits: Identify with self-adhesive vinyl tape applied in bands.
1. Locate identification at changes in direction, at penetrations of walls and floors, at 20-foot maximum intervals in straight runs, and at 15-foot maximum intervals in congested areas.
- F. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels containing the wiring system legend and system voltage. System legends shall be as follows:

1. Label Colors:

<u>System Type</u>	<u>Identification</u>	<u>Background</u>	<u>Lettering</u>
Lighting and Power Voltage	Standard	Orange	White
Cable Television	CATV	Brown	White
Clock	CLOCK	Black	White
Data	DATA	Violet	White
Emergency Circuits	EMERG	Yellow	Black
Energy Management System	EMS	White	Black
Fiber Optic System	FIBER	Pink	Black
Fire Alarm	FIRE	Red	White
Independent Public Address	IPA	Gray	White
Security/Intrusion	SECUR	Green	White
Telecommunications	TELECOM	Blue	White

2. Label Sizes:

<u>System Type</u>	<u>Size</u>	<u>Background</u>	<u>Lettering</u>
Lighting and Power	2" (w) x3" (h)	Orange	3/8" White
Cable TV System	2" (w) x3" (h)	Brown	3/8" White
Clock System	2" (w) x3" (h)	Black	3/8" White
Data System	2" (w) x3" (h)	Violet	3/8" White

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SPECIFICATIONS**NO. CP25-1029-52-00-00**

Emergency Circuits	2" (w) x3" (h)	Yellow	3/8" Black
Energy Management System	2" (w) x3" (h)	White	3/8" Black
Fiber Optic System	2" (w) x3" (h)	Pink	3/8" Black
Fire Alarm System	2" (w) x3" (h)	Red	3/8" White
Independent Public Address System	2" (w) x3" (h)	Gray	3/8" White
Security/Intrusion System	2" (w) x3" (h)	Green	3/8" White
Telecommunication System	2" (w) x3" (h)	Blue	3/8" White

- G. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
- H. Power-Circuit Conductor Identification, More Than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use brass tags colored and marked to indicate phase, and a separate tag with the circuit designation.
- I. Install instructional sign, including the color code for grounded and ungrounded conductors using adhesive-film-type labels.
- J. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive vinyl labels with the conductor or cable designation, origin, and destination.
- K. Control-Circuit Conductor Termination Identification: For identification at terminations, provide heat shrink preprinted tubes with the conductor designation.
- L. Branch Circuit Conductor Identification: For conductors in pull and junction boxes use heat shrink preprinted tubes with the conductor branch circuit number and panel designation.
- M. Receptacle and Light Switch Cover Plates: For all receptacles and local light switch plates, occupancy sensors and other lighting control devices, the cover plates shall be engraved or silkscreened with the panel and circuit number identified.
- N. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.
- O. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

- P. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
1. Install underground-line warning tape for cables in raceways.
- Q. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall comply with CEC and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- R. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Baked-enamel warning signs.
1. Identify system voltage with black letters on an orange background.
 2. Apply to exterior of door, cover, or other access.
 3. For equipment with multiple power or control sources, apply to door or cover of equipment, including:
 - a. Power-transfer switches.
 - b. Controls with external control power connections.
- S. Arc Flash Warning Labeling: Self-adhesive thermal transfer vinyl labels.
1. Comply with CEC and ANSI Z535.4.
 2. Comply with Section 26 05 73.19 " Arc-Flash Hazard Analysis" requirements for arc-flash warning labels.
- T. Operating Instruction Signs: Baked-enamel warning signs.
- U. Emergency Operating Instruction Signs: Baked-enamel warning signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.
- V. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm unless equipment is provided with its own identification.
1. Labeling Instructions:
 - a. Indoor Equipment: Engraved, laminated acrylic or melamine plastic label, punched or drilled for mechanical fasteners. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.

- c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - d. Unless labels are provided with self-adhesive means of attachment, fasten them with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
2. Equipment To Be Labeled:
- a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of an engraved, laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Access doors and panels for concealed electrical items.
 - d. Switchboards.
 - e. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
 - f. Emergency system boxes and enclosures.
 - g. Motor-control centers.
 - h. Enclosed switches.
 - i. Enclosed circuit breakers.
 - j. Enclosed controllers.
 - k. Variable-speed controllers.
 - l. Push-button stations.
 - m. Power-transfer equipment.
 - n. Contactors.
 - o. Remote-controlled switches, dimmer modules, and control devices.
 - p. Battery-inverter units.
 - q. Battery racks.
 - r. Power-generating units.
 - s. Monitoring and control equipment.
 - t. UPS equipment.
 - u. Receptacle and switch cover plates
 - v. Voice and data cable terminal equipment.
 - w. Master clock and program equipment.
 - x. Intercommunication and call system master and staff stations.
 - y. Television/audio components, racks, and controls.
 - z. Fire-alarm control panel and annunciators.
 - aa. Security and intrusion-detection control stations, control panels, terminal cabinets, and racks.
 - bb. Terminals, racks, and patch panels for voice and data communication and for signal and control functions.

END OF SECTION 26 05 53

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SECTION 26 08 00**COMMISSIONING OF ELECTRICAL SYSTEMS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY**A. Section Purpose**

- 1. Commissioning (Cx) of specific electrical systems noted in this section for functionality, process and operation. Acceptance testing, product testing and equipment testing are specified in each individual Division 26 specification section.
- 2. For example, an emergency power system has testing of engine generator, automatic transfer switch and switchboards specified in each individual section. Commissioning entire emergency power system, consisting of all components, is specified in this section.

- B. Section includes Cx process requirements for the following electrical components, systems, assemblies, and equipment:

- 1. Electrical equipment connected to Normal power system, including:
 - a. Motor-control centers.
 - b. Transformers.
 - c. Primary and secondary service electrical systems.
 - d. Distribution and branch-circuit panelboards.
 - e. Lightning protection systems.
 - f. Grounding systems.
- 2. Electrical equipment connected to Essential power systems that provide an alternative source of power in the absence of power from the Normal power system, including:
 - a. Motor-control centers.
 - b. Primary and secondary service electrical systems.
 - c. Distribution and branch-circuit panelboards.

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- d. Lighting protection systems.
 - e. Grounding systems.
 - f. Generators.
 - g. UPS.
- 3. Controls and instrumentation, including:
 - a. Equipment monitoring systems.
 - b. Energy monitoring and control systems.
 - c. Electrical metering and metering system.
 - d. Demand response systems.
 - e. Lighting control systems.
- 4. Systems testing and verification, including Normal power systems.
- 5. HVAC/DDC Lighting BAS interface.

1.3 REFERENCES

- A. NETA Standards: Currently enforced edition.

1.4 DEFINITIONS

- A. BAS: Building Automation System.
- B. DDC: Direct Digital Control
- C. Low Voltage: 600 V and below.
- D. Normal Power System: A power system that provides primary power to a facility.
- E. "Systems," "Assemblies," "Subsystems," "Equipment," and "Components": Where these terms are used together or separately, they shall mean "as-built" systems, assemblies, subsystems, equipment, and components.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency and Title 24 Certified Technicians
- B. Pre-Functional Checklists (PFCs), including:
 - 1. Instrumentation and control for electrical systems.
 - 2. Instrumentation and control for lighting control systems.
 - 3. Low-voltage power cables.
 - 4. Control voltage power cables.

5. Electrical feeders and branch circuits.
6. Dry-type transformers.
7. Instrument transformers.
8. Switchboard assemblies.
9. Motor-control centers.
10. Low-voltage motor starters.
11. Low-voltage insulated case circuit breakers.
12. Low-voltage surge protective devices.
13. Metering devices.
14. Molded-case circuit breakers.
15. Low-voltage power circuit breakers.
16. Grounding systems.
17. Ground-fault protection systems.
18. Panelboards.
19. Receptacles and devices.
20. Variable-frequency drives.
21. Battery systems.
22. Battery chargers.
23. UPS systems.
24. Interior and exterior Lighting and controls

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance (O&M) Data: For electrical systems and components to include in O&M manuals.
- B. Title 24 Power Distribution Testing:
 1. Certificate of Compliance for power distribution system.
 2. Copies of signed Certificates of Installation.
 3. Copies of signed acceptance forms.
 4. Completed testing script.
- C. Title 24 Lighting and Controls Testing:
 1. Certificate of Compliance for lighting and lighting control systems.
 2. Copies of signed Certificates of Installation.
 3. Copies of signed acceptance forms.
 4. Completed testing script.
- D. Emergency Lighting/Inverter:
 1. Certificate of Compliance for operation of emergency lighting system and inverter.
 2. Copies of signed Certificates of Installation.
 3. Copies of signed acceptance forms.
 4. Completed testing script.

E. DDC/HVAC lighting BAS Interface:

1. Certificate of Compliance for DDC/HVAC lighting interface with BAS.
2. Completed Cx script.

1.7 QUALITY ASSURANCE**A. Testing Agency Qualifications:**

1. Member company of NETA; NETA registered and certified.
2. Regularly engaged in Cx of electrical equipment, devices, installations, and systems, with at least five years of documented experience.
3. All Cx shall be per NETA standards.
4. Testing agency's lead, on-site, technical person shall be currently certified by NETA in electrical power distribution system testing.
5. Testing agency's engineers and technicians must be regularly employed by testing agency for Cx testing services.

B. Title 24 Certified Technician Qualifications:

1. Certified by California State Energy Commission for performing Title 24 Cx of power and lighting control systems as installed.
2. Independent third party; not an employee of Contractor.

C. Testing Equipment and Instrumentation Quality and Calibration: For test equipment and instrumentation required to perform electrical Cx work, perform the following:

1. Submit test equipment and instrumentation list. For each equipment or instrument, identify:
 - a. Equipment/instrument identification number.
 - b. Planned Cx application or use.
 - c. Manufacturer, make, model, and serial number.
 - d. Calibration history, including certificates from agencies that calibrate the equipment and instrumentation.
2. Test equipment and instrumentation shall meet the following criteria:
 - a. Capable of testing and measuring performance within specified acceptance criteria.
 - b. Be calibrated at manufacturer's recommended intervals with current calibration tags permanently affixed to instrument being used.
 - c. Be maintained in good repair and operating condition throughout duration of use on Project.
 - d. Be recalibrated/repared if dropped or damaged in any way since last calibrated.

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D. Proprietary Test Instrumentation and Tools:

1. Equipment Manufacturer's Proprietary Instrumentation and Tools: For installed equipment included in Cx process, test instrumentation and tools manufactured or prescribed by equipment manufacturer to service, calibrate, adjust, repair, or otherwise work on its equipment or required as a condition of equipment warranty, perform the following:
 - a. Submit proprietary instrumentation and tools list. For each instrument or tool, identify:
 - 1) Instrument or tool identification number.
 - 2) Equipment schedule designation of equipment for which instrument or tool is required.
 - 3) Manufacturer, make, model, and serial number.
 - 4) Calibration history, including certificates from agencies that calibrate the instrument or tool, where appropriate.
 - b. Include a separate list of proprietary test instrumentation and tools in O&M manuals.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 PRE-FUNCTIONAL CHECKLISTS (PFCs)**

- A. Prepare detailed PFCs for electrical systems, subsystems, equipment, and components. Complete and submit PFCs.

3.2 COMMISSIONING AUTHORITY (CxA) PRE-FUNCTIONAL CHECKLIST (PFC) REVIEW

- A. Review and provide written comments on Contractor's draft PFCs.
- B. Return draft PFCs review comments within 10 days of receipt.
- C. When review comments have been resolved, CxA will mark Contractor's final PFCs, "Approved for Use, (date)."
- D. Use only PFCs, marked "Approved for Use, (date)."

3.3 GENERAL TESTING REQUIREMENTS

- A. Engage a third party testing agency and a third party Certified Title 24 Technician to perform specified tests and inspection services.
- B. Perform routine insulation resistance, continuity, and phase rotation tests for all distribution and utilization equipment prior to and in addition to specified tests.
- C. Notify District Construction Manager and District Electrical Inspector no fewer than 14 working days prior to commencement of any Cx.
- D. Report any system, material, or workmanship that is found defective on the basis of Cx to District Construction Manager and District Electrical Inspector, along with recommendations for corrective action.

3.4 INSPECTION AND TEST PROCEDURES

- A. Provide testing agency a copy of related Contract Documents, including drawings, specifications, engineer-reviewed submittals and other necessary information.
- B. Supply a suitable source of power to each site and location per testing agency requirements.
- C. Notify testing agency when equipment becomes available for Cx and tests. Coordinate work with accepted project schedule.
- D. Testing agency shall review and evaluate all received documents and immediately notify Contractor, District Electrical Inspector and District Construction Manager of any discrepancies in the documents and any other issues or requirements.
- E. Testing agency shall provide and comply with:
 - 1. Test procedures for each individual specification section prior to any test and after thorough evaluation of the system. Testing shall conform to NETA specifications and standards for electrical power distribution equipment and systems and manufacturer's instructions.
 - 2. Refer to each individual specification section for testing requirements.
 - 3. Inspect installed equipment and report non-compliance with Contract Documents and governing codes prior to Cx and testing.
- F. Certify that electrical systems, subsystems, and equipment have been installed, calibrated, and started, and that they are operating according to Contract Documents and approved Shop Drawings and submittals.
- G. Certify that electrical instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents and approved Shop Drawings and submittals, and that pretest set points have been recorded.

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- H. Set systems, subsystems, and equipment into operating mode to be tested according to approved test procedures (for example, normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, alarm conditions).
- I. Measure capacities and effectiveness of systems, assemblies, subsystems, equipment, and components, including operational and control functions to verify compliance with acceptance criteria.
- J. Test systems, assemblies, subsystems, equipment, and components operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and response according to acceptance criteria.
- K. PFCs: Prepare and submit detailed PFCs for electrical systems, subsystems, equipment, and components.
 - 1. Contributors to development of PFCs include:
 - a. Electrical systems and equipment installers.
 - b. Electrical instrumentation and controls installers.
- L. Perform tests using design conditions, whenever possible.
 - 1. Simulated conditions may, with approval of Architect and District Construction Manager, be imposed using an artificial load when it is impractical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by CxA, and document simulated conditions and methods of simulation. After tests, return configurations and settings to normal operating conditions.
 - 2. Cx test procedures may direct that set points be altered when simulating conditions is impractical.
 - 3. Cx test procedures may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are impractical.
- M. If tests cannot be completed because of a deficiency outside scope of electrical system, document deficiency and report it to District Construction Manager. After deficiencies are resolved, reschedule tests.
- N. If seasonal testing is specified, complete appropriate initial performance tests and documentation and schedule seasonal tests.
- O. Coordinate schedule with, and perform, Cx activities at direction of CxA.
- P. Comply with PFC requirements, including material verification, installation checks, startup, and performance tests requirements specified in Sections specifying electrical systems and equipment.

Q. Provide technicians, instrumentation, tools, and equipment to complete and document the following:

1. Performance tests.
2. Demonstration of a sample of performance tests.
3. Cx tests.
4. Cx test demonstrations.

3.5 TITLE 24 POWER DISTRIBUTION COMMISSIONING (Cx)

A. Title 24 Testing of Power Distribution System

1. Provide all material, equipment, labor, and technical supervision to perform such tests and inspections.
2. Purpose of Tests: To assure that all tested electrical equipment is operational and within parameters of CCR Title 24, and installed in accordance with Contract Documents.
3. The following systems shall be certified by Title 24 Certified Technician:
 - a. Electrical service metering.
 - b. Disaggregation of electrical circuits.
 - c. Voltage Drop for feeders and branch circuits.
 - d. Circuit controls for 120 volt receptacles.

B. Title 24 Certified Technician shall provide:

1. Test Plan.
2. Functional Performance Testing Documentation and Training.
3. Test Report.
4. Installation and Acceptance Compliance Forms.

3.6 TITLE 24 LIGHTING CONTROL TESTING

A. Title 24 Testing of lighting system includes:

1. Automatic Day Lighting Control.
2. Occupant sensor.
3. Automatic Time Switch Control.
4. Demand Responsive Controls.
5. Outdoor Motion Sensor.
6. Outdoor Lighting Shut Off Controls.

B. Certified Title 24 Technician shall provide:

1. Test Plan.

2. Functional Performance Testing.
3. Documentation and Training.
4. Test Report.
5. Installation, Acceptance, and Certificate of Compliance Forms.

3.7 DDC/HVAC LIGHTING BAS INTERFACE COMMISSIONING (Cx)

A. DDC/HVAC interface Cx includes:

1. Verify that each lighting controller, zone or space is monitored as to on/off status.
2. Verify that each lighting controller, zone or space can be controlled on or off and status is changed accordingly.
3. Verify that each occupancy/vacancy switch is controllable on or off.

B. CxA shall provide:

1. Cx Plan.
2. Functional Performance Testing.
3. Cx Report.

3.8 EMERGENCY LIGHTING AND INVERTER TESTING

A. Emergency lighting and inverter testing includes:

1. Verify all emergency lighting circuits and fixtures are properly circuited.
2. Simulate a power outage and verify emergency lighting fixtures are illuminated.
3. During simulation, inverter shall be left energized for 90 minute run time. Verify that all emergency lighting fixtures are illuminated during this period.

B. Provide:

1. Test Plan.
2. Functional Performance Testing.
3. Test Report.

3.9 Cx TESTS FOR ELECTRICAL SYSTEMS

A. Verification of Normal Power System Operation:

1. Prerequisites: Acceptance of results for PFCs for Division 26 electrical components associated with Normal power system.
2. Equipment and Systems to Be Tested: Division 26 electrical equipment.
3. Test Purpose: Verify operation of Normal power system.
4. Test Conditions: Energize components of Normal power system, one at a time.

5. Acceptance Criteria: Proper operation of Normal power system over a 24-hour period.
- B. Verification of Essential Power Systems Operation:
 1. Prerequisites:
 - a. Acceptance of results for PFCs for Division 26 electrical components associated with Essential power systems.
 - b. Completion of "Verification of Normal Power System Operation" tests.
 2. Equipment and Systems to Be Tested: Division 26 electrical equipment.
 3. Test Purpose: Verify operation of Essential power systems.
 4. Test Conditions:
 - a. Energize components of Normal power system.
 - b. Simulate a failure of Normal power system.
 5. Acceptance Criteria: Transfer of power from Normal to Essential power systems within project requirements.
- C. Verification of Control and Instrumentation:
 1. Prerequisites: Acceptance of results for PFCs.
- D. Test Purpose: Verify operation of control and monitoring systems for Normal and Essential power systems.
- E. Test Conditions:
 1. Energize components of Normal power system.
 2. Test operation of equipment.
- F. Acceptance Criteria: Operation of equipment according to project requirements.

3.10 DEFICIENCIES

- A. Correct all deficiencies reported by testing agency, District Electrical Inspector, and CxA. Repeat Cx and system function tests as necessary to achieve conformance with requirements, at no additional cost to District.

END OF SECTION 26 08 00

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SECTION 26 27 26**WIRING DEVICES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Standard-grade receptacles 125 V, 20 A.
 - 2. GFCI receptacles 125 V, 20 A.
 - 3. Twist-locking receptacles.
 - 4. Toggle switches 120/277 V, 20 A.
 - 5. Occupancy sensors.
 - 6. Wall-box dimmers.
 - 7. Wall plates.
 - 8. Floor service outlets.
 - 9. Poke-through assemblies.
- B. Related Requirements:
 - 1. Section 26 05 53 "Identification for Electrical Systems" for labeling of device cover plates.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

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- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- B. Comply with CEC.
- C. Comply with NEMA WD 1.
- D. Devices for District-Furnished Equipment:
 - 1. Receptacles: Match plug configurations.
- E. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: White unless otherwise indicated or required by CEC or device listing.
- F. Source Limitation: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.
- G. Occupancy Control Receptacles: Provide identification as required by CCR Title 24 Part 6.

2.2 STRAIGHT-BLADE RECEPTACLES

- A. Duplex Receptacles, 125 V, 20 A:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or Equal.

2. Description: Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498 and FS W-C-596.
5. Grade: Heavy duty.

B. Occupancy Controlled Receptacles, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or equal.
2. Description: Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498 and FS W-C-596.
5. Grade: Heavy duty.
6. Engraved markings indicating the controlled position, either split wired or for the complete duplex receptacle.

C. Tamper- Resistant Convenience Receptacles, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or Equal.
2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498 and FS W-C-596.
5. Marking: Listed and labeled as complying with CEC, "Tamper-Resistant Receptacles" Article.

D. Isolated-Ground Duplex Receptacles, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or Equal

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2. Description: Straight blade; equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts. Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498 and FS W-C-596.

2.3 GFCI RECEPTACLES 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A: Heavy-Duty Specification Grade.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or equal.
2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Type: Non-feed through.
5. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

B. Tamper-Resistant GFCI Receptacles, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or equal.
2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Type: Non-feed through.
5. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
6. Marking: Listed and labeled as complying with CEC, "Tamper-Resistant Receptacles" Article.

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2.4 TWIST-LOCKING RECEPTACLES**A. Single Convenience Receptacles, 125 V, 20 A:**

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or Equal.
2. Configuration: NEMA WD 6, Configuration L5-20R.
3. Standards: Comply with UL 498
4. Grade: Heavy duty.

B. Single Convenience Receptacles, 250 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or Equal.
2. Configuration: NEMA WD 6, Configuration L6-20R.
3. Standards: Comply with UL 498
4. Grade: Heavy duty.

2.5 TOGGLE SWITCHES**A. Single-Pole Switches, 120/277 V, 20 A, Heavy-Duty Specification Grade:**

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or equal.
2. Standards: Comply the UL 20 and FS-W-S 896
3. Grade: Heavy duty.

B. Two Pole Switches 120/277 V, 20 A**WIRING DEVICES****26 27 26 - 5****KITCHEN MODIFICATIONS GROUP 6**

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or equal.
2. Standards: Comply the UL 20 and FS-W-S 896
3. Grade: Heavy duty.

C. Pilot-Light Switches, 120/277V, 20 A:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or Equal.
2. Description: Single pole, with neon-lighted handle, illuminated when switch is "off."
3. Standards: Comply the UL 20 and FS-W-S 896.

D. Key-Operated Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or Equal.
2. Description: Single pole, with factory-supplied key in lieu of switch handle.
3. Standards: Comply with NEMA WD 1, UL 20, and FS W-S-896.
4. Grade: Heavy duty.

2.6 OCCUPANCY SENSORS

A. Wall Switch Sensors Light Switch, Dual Technology:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. WattStopper.

- d. Or Equal.
 - 2. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual (ultrasonic and passive infrared) technology.
 - 3. Standards: Comply with UL 20.
 - 4. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
 - 5. Adjustable time delay of 20 minutes.
 - 6. Able to be locked to Automatic-On mode.
 - 7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
 - 8. Connections: Provisions for connection to BAS.
- B. Wall Sensor Light Switch, Passive Infrared:
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. WattStopper.
 - d. Or Equal.
 - 2. Standards: Comply with UL 20.
 - 3. Connections: Provisions for connection to BAS.
 - 4. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
 - 5. Integral relay for connection to BAS.
 - 6. Adjustable time delay of 20 minutes.
 - 7. Able to be locked to Automatic-On mode.
 - 8. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
- C. Wall Sensor Light Switch, Ultrasonic:
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. Wattstopper.
 - d. Or Equal
 - 2. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using ultrasonic technology.
 - 3. Standards: Comply with UL 20.
 - 4. Connections: Provisions for connection to BAS.

5. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
6. Integral relay for connection to BAS.
7. Adjustable time delay of 20 minutes.
8. Able to be locked to Automatic-On mode.
9. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.

D. Exterior Occupancy Sensors:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. Leviton Manufacturing Co., Inc.
 - c. WattStopper.
 - d. Or Equal.
2. Description: Commercial grade, passive-infrared type, 120/277 V, weatherproof, adjustable time delay up to 15 minutes, 180-degree field of view, and 110-foot detection range. Minimum switch rating: 1000-W incandescent, 500-VA fluorescent.

2.1 DIMMERS

A. Wall Box Dimmers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Leviton Manufacturing Co., Inc.
 - b. Lutron Electronics Co., Inc.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
 - d. Or Equal.
2. Description: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
3. Control: Continuously adjustable toggle switch; with single-pole or three-way switching. Comply with UL 1472.
4. LED Lamp Dimmer Switches: Modular; compatible with LED lamps; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.2 WALL PLATES

- A. Single Source:** Obtain wall plates from same manufacturer of wiring devices.

- B. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: 0.035-inch-thick, satin-finished, Type 302 stainless steel.
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.3 FLOOR SERVICE FITTINGS

- A. Flush-Type Floor Service Fitting:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Premise Wiring.
 - b. Thomas & Betts Power Solutions; ABB Group.
 - c. Wiremold / Legrand.
 - d. Or Equal.
 - 2. Description: Type: Modular, flush-type, dual-service units suitable for wiring method used, with cover flush with finished floor.
 - 3. Compartments: Barrier separates power from voice and data communication cabling.
 - 4. Service Plate and Cover: Round, die-cast aluminum with satin finish.
 - 5. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
 - 6. Data Communication Outlet: Two modular, keyed, color-coded, RJ-45 jacks for twisted pair cable, complying with requirements in Section 271513 "Communications Copper Horizontal Cabling."
- B. Flap-Type Service Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Premise Wiring.
 - b. Thomas & Betts Power Solutions; ABB Group.
 - c. Wiremold/Legrand
 - d. Or Equal

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2. Description: Type: Modular, flap-type, dual-service units suitable for wiring method used, with flaps flush with finished floor.
3. Compartments: Barrier separates power from voice and data communication cabling.
4. Flaps: Round, die-cast aluminum with satin finish.
5. Service Plate: Same finish as flaps.
6. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
7. Data Communication Outlet: Two modular, keyed, color-coded, RJ-45 jacks for twisted pair cable, complying with requirements in Section 271513 "Communications Copper Horizontal Cabling."

C. Above-Floor Service Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Premise Wiring.
 - b. Thomas & Betts Corporation; ABB Group.
 - c. Wiremold / Legrand.
 - d. Or Equal
2. Description: Type: Modular, above-floor, dual-service units suitable for wiring method used.
3. Compartments: Barrier separates power from voice and data communication cabling.
4. Service Plate: Round, die-cast aluminum with satin finish.
5. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
6. Data Communication Outlet: Two modular, keyed, color-coded, RJ-45 jacks for twisted pair cable, complying with requirements in Section 271513 "Communications Copper Horizontal Cabling."

2.4 POKE-THROUGH ASSEMBLIES

- A. Description: Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Hubbell Incorporated; Wiring Device-Kellems.
 2. Pass & Seymour/Legrand (Pass & Seymour).
 3. Wiremold/Legrand.

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- 4. Or Equal.
 - C. Standards: Comply with scrub water exclusion requirements in UL 514.
 - D. Service-Outlet Assembly: Flush type with two simplex receptacles and space for two RJ-45 jacks Flush type with upto four simplex receptacles and space for upto four RJ-45 jacks as indicated on drawings, complying with requirements in Section 271513 "Communications Copper Horizontal Cabling."
 - E. Size: Selected to fit nominal 4-inch cored holes in floor and matched to floor thickness.
 - F. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.
 - G. Closure Plug: Arranged to close unused 4-inch cored openings and reestablish fire rating of floor.
 - H. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of four, four-pair cables that comply with requirements in Section 271513 "Communications Copper Horizontal Cabling."
- 2.5 FINISHES
- A. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: White unless otherwise indicated or required by CEC or device listing.
 - B. Wall Plate Color: 0.035-inch-thick, satin-finished, Type 302 stainless steel.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Comply with NECA 1, including mounting heights listed in that standard or per the CEC unless otherwise noted on Drawings.
- B. Coordination with Other Trades:
 - 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.

4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of CEC, Article 300, without pigtails.
 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 8. Tighten unused terminal screws on the device.
 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.**I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.****J. Do not install vacancy sensors in any path of egress. Install occupancy/vacancy sensors in areas per the latest edition of CEC Title 24****3.2 GFCI RECEPTACLES**

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.**

3.3 IDENTIFICATION

- A. Comply with Section 26 05 53 "Identification for Electrical Systems."**
- B. Receptacle and Light Switch Cover Plates:** Engraved or silk screened with panel and circuit number identified for each device.

3.4 FIELD QUALITY CONTROL

- A. Test Instruments:** Use instruments that comply with UL 1426.
- B. Test Instrument for Convenience Receptacles:** Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- C. Tests for Receptacles:**
1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.

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6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- D. Wiring device will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION 26 27 26

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**SECTION 26 28 13
FUSES****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. Cartridge fuses rated 600 V ac and less for use in the following:
 - a. Control circuits.
 - b. Motor-control centers.
 - c. Switchboards.
 - d. Enclosed controllers.
 - e. Enclosed switches.
- 2. Spare-fuse cabinets.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:
 - 1. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.
 - a. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
 - b. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.
 - 2. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
 - 3. Fuse sizes for elevator feeders and elevator disconnect switches.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 01 77 00 "Closeout Procedures," include the following:
1. Ambient temperature adjustment information.
 2. Current-limitation curves for fuses with current-limiting characteristics.
 3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse used on the Project. Submit in PDF format.
 4. Coordination charts and tables and related data.

1.5 FIELD CONDITIONS

- A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper Bussmann; a division of Cooper Industries.
 2. Littelfuse, Inc.
 3. Mersen USA.
 4. Or Equal.
- B. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.
1. Type RK-5: 600-V, zero- to 600-A rating, 200 kAIC, time delay. Use this type of fuse with HVAC units.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- C. Comply with NEMA FU 1 for cartridge fuses.
- D. Comply with NFPA 70.
- E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

2.3 SPARE-FUSE CABINET

- A. Characteristics: Wall-mounted steel unit with full-length, recessed piano-hinged door and key-coded cam lock and pull.
 - 1. Size: Adequate for storage of spare fuses specified with 15 percent spare capacity minimum.
 - 2. Finish: Gray, baked enamel.
 - 3. Identification: "SPARE FUSES" in 1-1/2-inch-high letters on exterior of door.
 - 4. Fuse Pullers: For each size of fuse, where applicable and available, from fuse manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.
- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.
- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

- A. Cartridge Fuses:
 - 1. Motor Branch Circuits: Class RK5, time delay.

3.3 INSTALLATION

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.
- B. Install spare-fuse cabinet(s) in location shown on the Drawings or as indicated in the field by District Construction Manager.

3.4 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems" and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 26 28 13

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SECTION 26 28 16
ENCLOSED SWITCHES AND CIRCUIT BREAKERS

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. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Shunt trip switches.
 - 4. Molded-case circuit breakers (MCCBs).
 - 5. Enclosures.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
 - 1. Enclosure types and details for types other than NEMA 250, Type 1.
 - 2. Current and voltage ratings.
 - 3. Short-circuit current ratings (interrupting and withstand, as appropriate).
 - 4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.

- 1. Wiring Diagrams: For power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.
- C. Field quality-control reports.
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
 - 1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
 - 2. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF format.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Accredited by NETA.
 - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - 1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.

2. Altitude: Not exceeding 6600 feet.

B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by District or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify District Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without District Construction Manager's written permission.
4. Comply with NFPA 70E.

1.9 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified.

2.2 GENERAL REQUIREMENTS

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.

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- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- D. Comply with CEC.

2.3 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Sector; Eaton Corporation.
 - 2. Siemens Industry, Inc.
 - 3. Square D; by Schneider Electric.
 - 4. Or Equal.
- B. Type HD, Heavy Duty.
 - 1. Single throw.
 - 2. Three pole.
 - 3. 600-V ac.
 - 4. 1200 A and smaller.
 - 5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses.
 - 6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 - 3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 - 4. Lugs: Mechanical type, suitable for number, size, and conductor material.
 - 5. Service-Rated Switches: Labeled for use as service equipment.

2.4 NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

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1. Eaton Electrical Sector; Eaton Corporation.
 2. Siemens Industry, Inc.
 3. Square D; by Schneider Electric.
 4. Or Equal.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Type HD, Heavy Duty, Three Pole, Double Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- D. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 3. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.5 SHUNT TRIP SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper Bussmann; a division of Cooper Industries.
 2. Littelfuse, Inc.
 3. Mersen USA.
 4. Or Equal.
- B. General Requirements: Comply with ASME A17.1, UL 50, and UL 98, with 200-kA interrupting and short-circuit current rating when fitted with Class J fuses.
- C. Type HD, Heavy-Duty, Three Pole, Single-Throw Fusible Switch: 600-V ac, with amperage indicated on drawings; UL 98 and NEMA KS 1; integral shunt trip mechanism; horsepower rated, with clips or bolt pads to accommodate specified fuses; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.
- D. Type HD, Heavy-Duty, Three Pole, Single-Throw Nonfusible Switch: 600-V ac, with amperage indicated on drawings; UL 98 and NEMA KS 1; integral shunt trip mechanism; horsepower rated, lockable handle with capability to accept three padlocks; interlocked with cover in closed position.
- E. Control Circuit: 120-V ac; obtained from integral control power transformer, with primary and secondary fuses, with a control power transformer of enough capacity to operate shunt trip, connected pilot, and indicating and control devices.

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F. Accessories:

1. Oiltight key switch for key-to-test function.
2. Oiltight green ON pilot light.
3. Isolated neutral lug; 100 percent rating.
4. Mechanically interlocked auxiliary contacts that change state when switch is opened and closed.
5. Form C alarm contacts that change state when switch is tripped.
6. Three-pole, double-throw, fire-safety and alarm relay; 24-V dc coil voltage.
7. Three-pole, double-throw, fire-alarm voltage monitoring relay complying with NFPA 72.

2.6 MOLDED-CASE CIRCUIT BREAKERS**A. Manufacturers:** Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Sector; Eaton Corporation.
2. Siemens Industry, Inc.
3. Square D; by Schneider Electric.
4. Or Equal.

B. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.**C.** Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.**D.** The maximum ampere rating and UL, CEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker.**E.** MCCBs shall be equipped with a device for locking in the isolated position.**F.** Lugs shall be suitable for 60 degree C rated wire on 125-A circuit breakers and below, 75 degree C rated wire, sized according to the 75 degree C temperature rating in CEC.**G.** Standards: Comply with UL 489 with interrupting capacity to comply with available fault currents.

- H. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame through sizes 125 A to 225 A.
- I. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
- J. Electronic Trip Circuit Breakers: 250 A and larger, field-replaceable rating plug, rms sensing, with the following field-adjustable settings:
 - 1. Instantaneous trip.
 - 2. Long- and short-time pickup levels.
 - 3. Long- and short-time time adjustments.
 - 4. Ground-fault pickup level, time delay, and I^2t response.
- K. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.
- L. Ground-Fault, Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
- M. Features and Accessories:
 - 1. Standard frame sizes, trip ratings, and number of poles.
 - 2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
 - 3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
 - 4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
 - 5. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
 - 6. Auxiliary Contacts: One SPDT switch with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
 - 7. Alarm Switch: One NC contact that operates only when circuit breaker has tripped.
 - 8. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
 - 9. Zone-Selective Interlocking: Integral with ground-fault trip unit; for interlocking ground-fault protection function.
 - 10. Electrical Operator: Provide remote control for on, off, and reset operations.

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2.7 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
- B. Enclosure Finish: The enclosure shall be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1) for interior locations and gray baked enamel paint, electrodeposited on cleaned, phosphatized galvanized steel (NEMA 250 Types 3R, 12) for exterior locations.
- C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.
- D. Operating Mechanism: The circuit-breaker operating handle shall be externally operable with the operating mechanism being an integral part of the box, not the cover. The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.
- E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.
- F. NEMA 250 Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected
 - 1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 PREPARATION

- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
1. Notify District Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
 2. Indicate method of providing temporary electric service.
 3. Do not proceed with interruption of electric service without District Construction Manager's written permission.
 4. Comply with NFPA 70E.

3.3 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

- A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 2. Outdoor Locations: NEMA 250, Type 3R.
 3. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
 4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
 5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

3.4 INSTALLATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- C. Comply with mounting and anchoring requirements specified in Section 26 05 48.16 "Seismic Controls for Electrical Systems."
- D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- E. Install fuses in fusible devices.
- F. Comply with NECA 1.

3.5 IDENTIFICATION

- A. Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Tests and Inspections for Switches:
 - 1. Visual and Mechanical Inspection:
 - a. Inspect physical and mechanical condition.
 - b. Inspect anchorage, alignment, grounding, and clearances.
 - c. Verify that the unit is clean.
 - d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
 - e. Verify that fuse sizes and types match the Specifications and Drawings.
 - f. Verify that each fuse has adequate mechanical support and contact integrity.
 - g. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
 - i. Verify correct phase barrier installation.
 - j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

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2. Electrical Tests:

- a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
- b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
- c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
- d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
- e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems., Low-Voltage."

C. Tests and Inspections for Molded Case Circuit Breakers:

1. Visual and Mechanical Inspection:

- a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
- b. Inspect physical and mechanical condition.
- c. Inspect anchorage, alignment, grounding, and clearances.
- d. Verify that the unit is clean.
- e. Operate the circuit breaker to ensure smooth operation.
- f. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

ENCLOSED SWITCHES AND CIRCUIT BREAKERS**26 28 16 - 11****KITCHEN MODIFICATIONS GROUP 6**

- a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - g. Inspect operating mechanism, contacts, and chutes in unsealed units.
 - h. Perform adjustments for final protective device settings in accordance with the coordination study.
2. Electrical Tests:
- a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
 - b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
 - c. Perform a contact/pole resistance test. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
 - d. Perform insulation resistance tests on all control wiring with respect to ground. Applied potential shall be 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable. Test duration shall be one minute. For units with solid state components, follow manufacturer's recommendation. Insulation resistance values shall be no less than two megohms.
 - e. Determine the following by primary current injection:
 - 1) Long-time pickup and delay. Pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 2) Short-time pickup and delay. Short-time pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 3) Ground-fault pickup and time delay. Ground-fault pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 4) Instantaneous pickup. Instantaneous pickup values shall be as specified and within manufacturer's published tolerances.
 - f. Perform minimum pickup voltage tests on shunt trip and close coils in accordance with manufacturer's published data. Minimum pickup voltage of the shunt trip and close coils shall be as indicated by manufacturer.

ENCLOSED SWITCHES AND CIRCUIT BREAKERS**26 28 16 - 12****KITCHEN MODIFICATIONS GROUP 6**

- g. Verify correct operation of auxiliary features such as trip and pickup indicators; zone interlocking; electrical close and trip operation; trip-free, anti-pump function; and trip unit battery condition. Reset all trip logs and indicators. Investigate units that do not function as designed.
 - h. Verify operation of charging mechanism. Investigate units that do not function as designed.
- 3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- 4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- 5. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

3.7 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 26 28 16

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SECTION 31 10 00**SITE CLEARING****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. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil.
 - 5. Removing above- and below-grade site improvements.
 - 6. Disconnecting, capping or sealing, and removing site utilities.
 - 7. Temporary erosion and sedimentation control.

- B. Related Requirements:

- 1. Section 01 50 00 "Temporary Facilities and Controls" for temporary erosion- and sedimentation-control measures.
 - 2. Section 02 41 19 "Selective Demolition."

1.3 DEFINITIONS

- A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface and existing in-place surficial organic soil layer; the zone where plant roots grow.
- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

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- E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.5 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain District's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.6 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or video recordings.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.7 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from District and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by District or authorities having jurisdiction.
 - 3. Maintain emergency vehicle access traffic ways at all times. If the Work impacts the emergency vehicle access traffic way, coordinate with the local Fire Marshal.
- B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining District's property will be obtained by District before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by District Construction Manager.

- C. Utility Locator Service: Retain a professional utility locator service and have all existing underground utilities located and surface-identified before site clearing.
- D. Do not commence site clearing operations until temporary erosion-control, sedimentation-control and plant-protection measures are in place.
- E. Tree- and Plant-Protection Zones: The following practices are prohibited within plant protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
 - 8. Do not direct vehicle or equipment exhaust toward protection zones.
 - 9. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- F. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.
- G. Burning: Burning is not permitted on the site.

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 20 00 "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.

- B. Locate and clearly identify trees, shrubs, and other vegetation to remain. Wrap a 1-inch blue vinyl tie tape flag around each tree trunk at 54 inches above the ground.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to District.

3.2 TREE AND PLANT PROTECTION

- A. Protect trees remaining on-site.
 - 1. Protect shrubs and other vegetation indicated to remain or be relocated.
 - 2. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by District Construction Manager.

3.3 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Coordinate with and follow all the requirements contained in Section 01 57 23 "Temporary Storm Water Pollution Control."
- C. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- D. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- E. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.4 EXISTING UTILITIES

- A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Protect all utilities to remain in place.
 - 3. Cap or seal utilities in accordance with the appropriate code and industry standard.

- B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by District or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify District Construction Manager not less than five days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without District Construction Manager's written permission.
- C. Removal of underground utilities is included in earthwork sections; in applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security, and utilities sections; and in Section 02 41 16 "Structure Demolition" and Section 02 41 19 "Selective Demolition."

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 6 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

SITE CLEARING

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1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off District's property.
- B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 31 10 00

SECTION 31 20 00**EARTH MOVING****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. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subsurface drainage backfill for walls and trenches.
6. Excavating and backfilling trenches for utilities and pits for buried utility structures.
7. Detectable warning tapes.

B. Related Requirements:

1. Section 01 21 00 "Allowances."
2. Section 01 32 01 "Construction Progress Documentation".
3. Section 01 32 33 "Photographic Documentation".
4. Section 03 30 00 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
5. Sections 26 05 53 for additional detectable warning tape requirements for underground Electrical and Communications Systems components.
6. Section 31 10 00 "Site Clearing".
7. Section 31 23 19 "Dewatering".

1.3 UNIT PRICES

- A. Quantity allowances for earth moving are included in Section 01 21 00 "Allowances."
- B. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.
 1. 24 inches outside of concrete forms other than at footings.

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2. 12 inches outside of concrete forms at footings.
3. 6 inches outside of minimum required dimensions of concrete cast against grade.
4. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
5. 6 inches beneath bottom of concrete slabs-on-grade.
6. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

1.4 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between the subbase course, or the subgrade if there is no subbase course, and hot-mix asphalt paving or concrete paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Drainage Course (Capillary Break): Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by District Construction Manager. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by District. Unauthorized excavation, as well as remedial work directed by District Construction Manager, shall be without additional compensation.
- G. Fill: Soil materials used to raise existing grades.
- H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch-maximum-width, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom.
 2. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket.
- I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- J. Subbase Course: Aggregate layer placed between the subgrade and base course for asphalt or concrete pavement.
- K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase or base course if there is no subbase, drainage fill, drainage course, or topsoil materials.
- L. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.5 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct pre-excavation conference at Project site.
1. Review methods and procedures related to earthmoving, including:
 - a. Personnel and equipment needed to make progress and avoid delays.
 - b. Coordination of Work with utility locator service.
 - c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
 - d. Extent of trenching by hand or with air spade.
 - e. Field quality control.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
1. Geotextiles.
 2. Detectable warning tapes.
- B. Samples for Verification: For the following products, in sizes indicated below:
1. Geotextile: 12-by-12 inches.

2. Detectable Warning Tapes: 12 inches long; of each color.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Material Test Reports: For each on-site soil material proposed for fill and backfill as follows:
 1. Classification according to ASTM D 2487.
 2. Laboratory compaction curve according to ASTM D 698.
- C. Pre-excavation Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.8 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: The District will retain a DSA accepted testing agency according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.9 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.
 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from District and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by District or authorities having jurisdiction.
 3. Maintain emergency vehicle access traffic ways at all times. If the Work impacts the emergency vehicle access traffic way, coordinate with the local Fire Marshal.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining District's property will be obtained by the District before award of Contract.
 1. Do not proceed with work on adjoining property until directed by the District Construction Manager.
- C. Utility Locator Service: Retain a professional utility locator service and have all existing underground utilities located and surface-identified before beginning earth-moving operations.

- D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 01 50 00 "Temporary Facilities and Controls", Section 01 57 23 "Temporary Storm Water Pollution Control" and Section 31 10 00 "Site Clearing" are in place.
- E. Do not commence earth-moving operations until plant-protection measures are in place.
- F. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- I. Existing Utilities: Do not interrupt utilities serving facilities occupied by District or others unless permitted in writing by District and then only after arranging to provide temporary utility services according to requirements indicated.
 - 1. Notify District not less than five days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without District's written permission.
- J. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS**2.1 SOIL MATERIALS**

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, free of rock or gravel larger than 4 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 1. Expansion Index: Not more than 50 as measured by ASTM D 4829.

2. Upper 18 inches of subgrade fill under landscaped areas: Soil containing not more than 10% stones or lumps larger than 1-1/2 inches.
 - C. Unsatisfactory Soils: Soil Classification Groups OL, CH, MH, OH, and PT according to ASTM D 2487; Soil Classification Groups GC, SC, CL and ML where those soils are classified as medium or highly expansive by ASTM D 4829.
 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
 - D. Backfill and Fill: Satisfactory soil materials.
 - E. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
 - F. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
 - G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
 - H. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
 - I. Drainage Course (Capillary Break): Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.
 - J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.
 - K. Sand: ASTM C 33/C 33M; fine aggregate.
 - L. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
- 2.2 GEOTEXTILES
- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with

elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: As follows:
 - a. Grab Tensile Strength: 157 lbf; ASTM D 4632.
 - b. Sewn Seam Strength: 142 lbf; ASTM D 4632.
 - c. Tear Strength: 56 lbf; ASTM D 4533.
 - d. Puncture Strength: 65 lbf; ASTM D 4833.
 2. Apparent Opening Size: No. 70 sieve, maximum; ASTM D 4751.
 3. Permittivity: 1.8 per second, minimum; ASTM D 4491.
 4. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Survivability: As follows:
 - a. Grab Tensile Strength: 247 lbf; ASTM D 4632.
 - b. Sewn Seam Strength: 222 lbf; ASTM D 4632.
 - c. Tear Strength: 90 lbf; ASTM D 4533.
 - d. Puncture Strength: 90 lbf; ASTM D 4833.
 2. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
 3. Permittivity: 0.02 per second, minimum; ASTM D 4491.
 4. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, resistant to destructive elements typically found in soil, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility encased within the tape to prevent the letters from being worn off, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
1. Colors, typical:
 - a. Red: Electric.
 - b. Yellow: Gas, oil, steam, and dangerous materials.
 - c. Orange: Telephone and other communications.
 - d. Blue: Water systems.
 - e. Green: Sewer and stormwater systems.
 - f. See related sections for more detailed requirements.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

3.2 DEWATERING

- A. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Geotechnical Engineer. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.
 - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the dimensions provided elsewhere in the Section.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 2. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
 3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
 1. Clearance: 12 inches each side of pipe or conduit unless otherwise indicated.
- C. Trench Bottoms:
 1. Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

2. Unless indicated otherwise, excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
 3. Unless indicated otherwise, excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- D. Trenches in Tree- and Plant-Protection Zones:
1. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.8 SUBGRADE INSPECTION

- A. Notify Project Inspector when excavations have reached required subgrade. The Project Inspector will arrange for the District's Testing Agency to review the subgrade.
- B. If Testing Agency determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
1. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Testing Agency, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Testing Agency, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by District Construction Manager.
1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by District Construction Manager.

3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 - 2. Obtain District's acceptance of stockpile locations prior to creation. If stockpile must be moved, obtain District's acceptance.

3.11 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring, bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
 - 1. Unless otherwise indicated, provide pea gravel bedding for sanitary sewer and storm sewer piping.
 - 2. Clean sand may be used for bedding under piping other than sewer piping.
- C. Trenches under Footings: Unless otherwise indicated, backfill trenches excavated under footings and within the zone of influence of bottom of footings with concrete to elevation of bottom of footings. Concrete is specified in Section 03 30 00 "Cast-in-Place Concrete."
- D. Trenches under Roadways and Driveways: Unless otherwise indicated, provide 4-inch-thick, concrete-base slab support for piping or conduit less than 30 inches below

finished surface of roadways or driveways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase course (or base course if no subbase course is indicated.) Concrete is specified in Section 03 30 00 "Cast-in-Place Concrete."

- E. Backfill voids with satisfactory soil while removing shoring and bracing.
- F. Initial Backfill:
 - 1. Soil Backfill: Place and compact initial backfill of pea gravel or satisfactory soil, free of particles larger than 1-inch in any dimension, to a height of 12 inches over the pipe or conduit.
 - a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- G. Final Backfill:
 - 1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
- H. Detectable Warning Tape Location:
 - 1. Install warning tape directly above utilities
 - 2. Typical: 12 inches below finished grade.
 - 3. When below subgrade under pavements and slabs: 6 inches below finished grade.
 - 4. See related sections for more detailed requirements.
- I. Coordinate backfilling with utilities testing.

3.13 SOIL FILL

- A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- C. Place and compact fill material in layers to required elevations.
- D. Place soil fill on subgrades free of mud, frost, snow, or ice.
- E. All imported soil material shall be approved by Geotechnical Engineer prior to hauling on site.

3.14 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.
 - 3. Under turf or unpaved areas, compact per requirements of Section 32 91 13 "Soil Preparation".
 - 4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent, except for areas under structures, building slabs, pavements and walkways.

3.16 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1-inch.
 2. Walks: Plus or minus 1-inch.
 3. Pavements: Plus or minus 1/2-inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2-inch when tested with a 10-foot straightedge.

3.17 SUBSURFACE DRAINAGE

- A. Subdrainage Pipe: Specified in Section 33 46 00 "Subdrainage."
- B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.
- C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. If indicated on drawings, overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

3.18 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
1. If subdrainage textile is indicated on drawings, install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Place base course material under hot-mix asphalt pavement.
 3. Shape base course to required crown elevations and cross-slope grades.
 4. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
 5. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
 7. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each

subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.19 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
 - 1. If subdrainage textile is indicated on drawings, install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 - 2. Place drainage course 6 inches or less in compacted thickness in a single layer.
 - 3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 - 4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.20 FIELD QUALITY CONTROL

- A. Testing Agency: District will engage a qualified independent geotechnical engineering testing agency to perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Project Inspector.
- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab but in no case fewer than three tests.
 - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length but no fewer than two tests.
 - 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 100 feet or less of trench length but no fewer than two tests.

- E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.21 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Geotechnical Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off District's property.

END OF SECTION 31 20 00

**SECTION 31 23 19
DEWATERING****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 construction dewatering.
- B. Related Requirements:
 - 1. Section 01 32 33 "Photographic Documentation" for recording preexisting conditions and dewatering system progress
 - 2. Section 31 20 00 "Earth Moving" for excavating, backfilling, site grading, and controlling surface-water runoff and ponding.

1.3 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to dewatering, including:
 - a. Inspection and discussion of condition of site to be dewatered including coordination with temporary erosion control measures and temporary controls and protections.
 - b. Geotechnical report.
 - c. Proposed site clearing and excavations.
 - d. Existing utilities and subsurface conditions.
 - e. Coordination for interruption, shutoff, capping, and continuation of utility services.
 - f. Construction schedule. Verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - g. Testing and monitoring of dewatering system and effluent.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: For dewatering system, prepared by or under the supervision of a qualified professional engineer.

1. Include plans, elevations, sections, and details.
2. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.
3. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
4. Include a written plan for dewatering operations including sequence of well and well-point placement coordinated with excavation shoring and bracings and control procedures to be adopted if dewatering problems arise.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer
- B. Field quality-control reports.
- C. Existing Conditions: Using photographs, show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by dewatering operations. Submit before Work begins.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer that has specialized in dewatering work.

1.7 FIELD CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by District or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
 1. Notify District no fewer than five days in advance of proposed interruption of utility.
 2. Do not proceed with interruption of utility without District's written permission.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. That report is not a part of the Contract Documents. The opinions expressed in that report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. District is not responsible for interpretations or conclusions drawn from this data.
 1. The geotechnical report is available for Contractor's examination. The Contractor shall make additional test borings and conduct other exploratory operations as necessary to perform the required dewatering.

- C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
 - 1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify the District Construction Manager if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.
- D. Site conditions will dictate design and use of dewatering systems.

PART 2 - PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
 - 1. Design dewatering system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
 - 2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, prevention of flooding in excavation, and prevention of damage to subgrades and permanent structures.
 - 3. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
 - 5. Remove dewatering system when no longer required for construction.
- B. Regulatory Requirements: Comply with governing EPA and other regulatory notification requirements before beginning dewatering. Comply with water- and debris-disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site or surrounding area.
 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from District and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Provide temporary grading to facilitate dewatering and control of surface water.
- D. Dewatering effluent to sanitary sewer shall require prior approval from the authorities having jurisdiction.
- E. A dewatering plan shall be submitted as part of the SWPPP / WPCP detailing the location of dewatering activities, equipment, and discharge point.
- F. The San Diego Regional Water Quality Control Board (RWQCB) may require a separate National Pollutant Discharge Elimination System (NPDES) permit prior to the dewatering discharge of non-storm water. These permits will have specific testing, monitoring, and discharge requirement and can take significant time to obtain.
- G. Non-storm water dewatering for discharges meeting certain conditions may be allowed under the RWQCB general dewatering NPDES Permit. Notification and approval from the RWQCB is required prior to conducting these operations. This includes storm water that is mixed with groundwater or other non-storm water sources. Once the discharge is allowed, appropriate BMP's must be implemented to ensure that the discharge complies with all permit requirements. The RWQCB General Orders, Permit, Waivers, and Forms should be reviewed for conditions for potential discharge for dewatering.
- H. If the presence of polluted water with hazardous substances is identified in the contract documents, the Contractor shall implement dewatering pollution controls as required by the contract documents.

3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material, valves, appurtenances, water disposal, and surface-water controls.
1. Space well points or wells at intervals required to provide sufficient dewatering.
 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

- B. Place dewatering system into operation to lower water to specified levels before excavating below ground-water level.
- C. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- D. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to District.
 - 1. The standby source of power or pumping unit(s) should be operated a minimum of four hours per week.

3.3 OPERATION

- A. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- B. Operate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
 - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
 - 2. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
 - 3. Maintain piezometric water level a minimum of 24 inches below bottom of excavation.
- C. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others and is in conformance with local permits, project specific permits, and regulations.
- D. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with in accordance with County of San Diego Department of Environmental Health requirements and regulations.

3.4 FIELD QUALITY CONTROL

- A. Observation Wells: Provide observation wells or piezometers, take measurements, and maintain at least the minimum number indicated; additional observation wells may be required by authorities having jurisdiction.

1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
 2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
 3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed in accordance with San Diego County Department of Environmental Health requirements and regulations.
- B. Survey-Work Benchmarks: Resurvey benchmarks regularly during dewatering and maintain an accurate log of surveyed elevations for comparison with original elevations. Promptly notify District Construction Manager if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.
- C. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.
- D. Prepare reports of observations.
- 3.5 PROTECTION
- A. Protect and maintain dewatering system during dewatering operations.
- B. Promptly repair damages to adjacent facilities caused by dewatering.

END OF SECTION 31 23 19

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 Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Chain-link fences.
 - 2. Swing gates.
- B. Related Requirements:
 - 1. Section 08 71 00 "Door Hardware" for electrified gate hardware.

1.3 COORDINATION

- A. Coordinate electrified gate hardware to comply with single source manufacturer requirement specified in section 08 71 00 Door Hardware.

1.4 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
 - 1. Review required testing, inspecting, and certifying procedures.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Fence and gate posts, rails, and fittings.
 - b. Chain-link fabric, reinforcements, and attachments.

- c. Accessories:
 - d. Gates and hardware.
 - B. Shop Drawings: For each type of fence and gate assembly.
 - 1. Include plans, elevations, sections, details, and attachments to other work. Show locations of gates, posts, rails, and tension wires, and details of gate swing, or other operation, hardware, and accessories.
 - 2. Indicate materials, dimensions, sizes, weights, and finishes of components.
 - 3. Include accessories, hardware, gate operation, and operational clearances.
 - C. Samples for Initial Selection: For each type of factory-applied finish.
- 1.6 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For testing agency.
 - B. Product Certificates: For each type of chain-link fence and gate.
 - C. Product Test Reports: For framework strength according to ASTM F 1043, for tests performed by manufacturer and witnessed by a qualified testing agency or a qualified testing agency.
 - D. Field quality-control reports.
 - E. Sample Warranty: For special warranty.
- 1.7 QUALITY ASSURANCE
- A. Testing Agency Qualifications: For testing fence grounding; member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.
 - B. Emergency Access Requirements: Comply with requirements of the Division of the State Architect (DSA) for gates serving as a required means of access.
 - C. Post and rail piping shall not be installed until the Project Inspector verifies that the material meets the specified weight per lineal foot for each pipe size to be used.
 - D. Post footing excavations shall be approved by the Project Inspector prior to setting any posts.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.9 WARRANTY

- A. Special Warranty: Manufacturer and Installer agree to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

- 1. Failures include:

- a. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - b. Fabric bowing, sagging, breakage or similar defects.
 - c. Fence framework failure.
 - d. Faulty operation of gate hardware.

- 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. Lightning Protection System: Maximum resistance-to-ground value of 25 ohms at each grounding location along fence under normal dry conditions.

2.2 FENCE FRAMEWORK

- A. Posts and Rails : ASTM F 1043 for framework, including rails, braces, and line; terminal; gate; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 or ASTM F 1083 based on the following:
 - 1. Fence Height: As indicated on Drawings.
 - 2. Heavy-Industrial-Strength Material: Group IA, round steel pipe, Schedule 40.
 - a. Thread protectors shall not be used as couplings under any circumstances.
 - b. All pipe used in chain link fencing shall be stamped by the manufacturer, either with indelible ink or incused, indicating the pipe wall thickness, inside diameter, ASTM standard to which it conforms, and the manufacturer's name.

- c. Line Post: 2.375 inches in diameter.
 - d. End, Corner, Gate, and Pull Posts: 2.875 inches in diameter.
 - e. Flanging of end (terminal) posts:
 - 1) Terminal posts and gate posts shall only be flanged to assist in relocatable building moves.
 - 2) A larger pipe shall be dropped over a smaller post only when a short run of existing fencing is terminated and when digging a new hole to install a bigger terminal post is impractical. This shall be used as a temporary repair, not as a permanent repair or installation.
 - 3) If it is necessary to create a removable section of fence (to assist in relocatable building moves), a smaller pipe shall be sleeved into a smaller line post.
 - 4) Sleeves sizes shall conform to ASTM A53, Schedule 40.
 - a) For a 2-inch Interior Diameter (ID) sleeve, insert 1 1/2" ID pipe.
 - b) For a 2-1/2-inch ID sleeve, insert 2-inch ID pipe.
 - c) For a 3-inch ID sleeve, insert a 2 1/2-inch ID pipe.
3. Horizontal Framework Members: Comply with ASTM F 1043.
- a. Top Rails: Provide at all chain-link fencing. Fabricate top rail from lengths 21 feet or longer, with wedged-end or fabricated for expansion-type coupling, forming a continuous rail along top of chain-link fabric. Provide expansion couplings 6 inches long at each joint in top rails.
 - 1) Top rail that carries water: Assemble with threaded fittings. Provide full-size main and branch tees at 54 feet +/- O.C. with reducer bushings (for loose key hose bibbs) and/or plug (for future irrigation water connections or where rail is cut for gates). Hose bibbs shall be 4-feet above grade. Provide threaded elbow and drop where gate openings are installed (Installation and connection of pipe elbow gates per Plumbing Specifications). Connect and maintain continuity of top water rail where fence height changes.
 - b. Intermediate Rails: Provide at tennis court and multi-purpose court wall fencing, and where indicated. Match top rail for finish and size.
 - c. Bottom Rails: Provide at athletic field, tennis and handball court, and multi-purpose court wall fencing. Also provide where decomposed granite, grass, planters and synthetic fields abut any fence line. Match top rail for finish and size.
4. Top Rails, Intermediate Rails, Bottom Rails and Brace Rails: 1.66 inches in diameter.
5. Post Brace Rails: Provide brace rail with truss rod assembly for each gate, end, and pull post. Provide two brace rails extending in opposing directions, each with truss rod assembly, for each corner post and for pull posts. Provide rail ends and clamps for attaching rails to posts.
6. Metallic Coating for Steel Framework:

- a. Type A: Not less than minimum 2.0-oz./sq. ft. average zinc coating according to ASTM A 123/A 123M; internal and external; hot-dipped after fabrication.
- 7. Polymer coating over metallic coating.
 - a. Color: As selected by Architect from manufacturer's full range, according to ASTM F 934.
- 8. Schedule of Pipe Sizes: See following Table 1.

TABLE 1

ASTM A53 Threaded and Coupled Pipe
Black and Galvanized 1/2" to 6"

Nominal Size	Outside Diameter		Wall Thickness			Weight		
Inches	Inches	mm	Inch	mm	. No	lb/ft	Kg/m	Kg/ft
1/2"	0.084	21.3	0.109	2.77	40 (STD)	0.85	1.26	0.39
			0.147	3.73	80 (XS)	1.09	1.62	0.49
3/4"	1.050	26.7	0.113	2.87	40 (STD)	1.13	1.68	0.51
			0.154	3.91	80 (XS)	1.48	2.20	0.67
1"	1.315	33.4	0.133	3.38	40 (STD)	1.68	2.50	0.76
			0.179	4.55	80 (XS)	2.18	3.24	0.99
1 1/4"	1.660	42.2	0.140	3.56	40 (STD)	2.288	3.39	1.04
			0.191	4.85	80 (XS)	3.02	4.49	1.37
1 1/2"	1.900	48.3	0.145	3.68	40 (STD)	2.73	4.06	1.24
			0.200	5.08	80 (XS)	3.66	5.45	1.66
2"	2.375	60.3	0.154	3.91	40 (STD)	3.68	5.42	1.67
			0.208	5.54	80 (XS)	5.07	7.55	2.30
2 1/2"	2.875	73.0	0.203	5.16	40 (STD)	5.82	8.66	2.64
			0.276	7.01	80 (XS)	7.73	11.50	3.51
3"	3.500	88.9	0.216	5.49	40 (STD)	7.62	11.34	3.46
			0.300	7.62	80 (XS)	10.33	15.37	4.69
3 1/2"	4.000	101.6	0.226	5.74	40 (STD)	9.2	13.69	4.18
			0.318	8.08	80 (XS)	12.63	18.80	5.73
4"	4.500	114.3	0.237	6.02	40 (STD)	10.89	16.21	4.94
			0.337	8.56	80 (XS)	15.17	22.58	6.89
6"	6.625	168.3	0.280	7.11	40 (STD)	18.97	28.23	8.60
			0.312	7.92	80 (XS)	21.04	31.31	9.54

9.

2.3 TENSION WIRE

- A. General: Provide horizontal bottom tension wire at all fence fabric not having a bottom rail.

- B. Metallic-Coated Steel Wire: 0.177-inch-diameter, marcelled tension wire according to ASTM A 817 or ASTM A 824, with the following metallic coating:
 - 1. Type II: Zinc coated (galvanized) by hot-dip process, with a Class 4 minimum coating weight; not less than 1.2 oz./sq. ft. of uncoated wire surface.
- C. Polymer-Coated Steel Wire: 0.177-inch-diameter, tension wire according to ASTM F 1664, Class 2a or 2b over zinc-coated steel wire.
 - 1. Color: Match chain-link fabric, according to ASTM F 934.

2.4 SWING GATES

- A. General: Comply with ASTM F 900 for gate posts and single swing gate types. See Table 2 for sizes.
 - 1. Gate Leaf Width: As indicated.
- B. Pipe and Tubing:
 - 1. Zinc-Coated Steel: ASTM A 53, ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framework; Schedule 40.
 - 2. Gate Posts: Round hot-dipped galvanized tubular steel with inside dimensions and weight according to Table 2 for the gate leaf widths required.
 - a. All gate posts shall be of sufficient strength so that the total deflection of the gate and the post at the end of the gate leaf shall not exceed the lesser of 2% of the gate leaf width or 4 inches.
 - b. When necessary to meet this requirement due to the total weight of the gate leaf, the next larger size posts required shall be used. Gates shall not be equipped with rollers or casters for support.
 - 3. Gate Frames and Bracing: Round hot-dipped galvanized tubular steel with minimum diameter of 1.900-inch. Provide diagonal cross-bracing, consisting of 3/8-inch diameter adjustable-length truss rods on welded gate frames, where necessary to obtain frame rigidity without sag or twist.
- C. Frame Corner Construction: Welded, with 5/16-inch diameter adjustable truss rods for panels 5 feet wide or wider.

TABLE 2

Swing gate member sizes		
Gate opening	Nominal size	lb/ft.
Single leaf to 6 feet	2 1/2"	5.79
Double leaf to 12 feet opening		
Single leaf 6 to 13 feet	3 1/2"	9.11

Double leaf 12 to 26 feet opening		
Single leaf 13 to 18 feet	6"	18.97
Double leaf 26 to 36 feet opening		

D. Hardware:

1. Hinges: Heavy-duty offset, with 180-degree inward swing.
 - a. In addition to bolting, spotweld all hinges to posts.
2. Latch: Permitting operation from both sides of gate.
 - a. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.
 - b. Single latches shall be industrial gravity type gate latch with automatic stop.
 - c. Double latch shall be drop bar 1.315-inch diameter nominal pipe size securely bolted to gate frame and shall engage an iron gate stop. Drop bar shall engage 1.900-inch pipe diameter pipe sleeve set in concrete. Provide drop bar keeper on gate to secure it in lifted position.
 - d. In addition to bolting, spotweld all latches to posts.
3. Padlock and Chain:
 - a. Provide means of padlocking gates in the open position where indicated that gate must be locked in open position during activity hours.
 - b. Chains: Provide each gate with 3-foot length of chain to secure gate to fence with a padlock when open. Install 3/4-inch round eye, corrosion-resistant harness snap on one end of chain. Cadmium-plating is not permitted. Secure chain with spotweld.
4. All screws and bolts shall be tamper-proof.
5. Provide center gate stops.
6. For all gates more than 5 feet wide, provide keepers.
7. Hardware for gates that are part of the access or egress system:
 - a. Gates (in Path-of-Travel), hardware, maneuvering clearances, and operation shall comply with applicable portions of CBC accessibility requirements.
 - b. Omit latch and make provisions to receive exit device hardware.
 - c. Provide 16 gage steel plate for mounting of exit device on gate and exit device latch on post. Size plate to protect against unauthorized operation of the exit device from the exterior as shown.
 - d. Mount operating hardware at minimum 30 inches and maximum 44 inches above grade or pavement surface.
8. See section 08 71 00 "Door Hardware".

2.5 FITTINGS

- A. Provide fittings according to ASTM F 626.
- B. Post and Line Caps: Hot-dipped galvanized pressed steel or hot-dipped galvanized cast iron. Provide weathertight closure cap for each post.
 - 1. Provide line post caps with loop to receive top rail.
- C. Rail and Brace Ends: Hot-dipped galvanized pressed steel or hot-dipped galvanized cast iron. Provide rail ends or other means for attaching rails securely to each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
 - 1. Top Rail Sleeves: Hot-dipped galvanized pressed steel or hot-dipped galvanized round-steel tubing not less than 6 inches long.
 - 2. Rail Clamps: Hot-dipped galvanized pressed steel. Provide line and corner boulevard clamps for connecting intermediate and bottom rails to posts.
- E. Tension and Brace Bands: Hot-dip galvanized pressed steel. Provide bands with projecting edges chamfered or eased.
- F. Tension Bars: Hot-dipped galvanized steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading, rod and turnbuckle or other means of adjustment.
- H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.
 - 1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:
 - a. Hot-Dip Galvanized Steel: 0.148-inch-diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.
- I. Finish:
 - 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.

2.6 CAST-IN-PLACE CONCRETE

- A. General: Comply with ACI 301 for cast-in-place concrete.

- B. Materials: Portland cement complying with ASTM C 150 Type II, aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94.

- 1. Concrete Mixes: Normal-weight concrete with not less than 3000-psi compressive strength (28 days), 4-inch slump, and 1-inch maximum size aggregate.

2.7 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

2.8 GROUNDING MATERIALS

- A. Comply with requirements in Section 26 05 26 "Grounding and Bonding for Electrical Systems."
- B. Connectors and Grounding Rods: Listed and labeled for complying with UL 467.
 - 1. Connectors for Below-Grade Use: Exothermic welded type.
 - 2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches.

2.9 OTHER MATERIALS

- A. Galvanizing Repair Material: Cold-applied, zinc-rich coating conforming to ASTM A 780.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading is completed unless otherwise permitted by District Construction Manager.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.
- B. Clear fence line of trees, brush, and other obstacles to install fencing. Establish a graded, compacted fence line prior to fencing installation.

3.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.
 - 1. Install fencing on established boundary lines inside property line.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
 - 1. If rock is encountered, excavate in accordance with 31 20 00 "Earth Moving."
- C. Post Setting: Set posts in concrete footings at indicated spacing into firm, undisturbed or compacted soil. Using mechanical devices to set line posts per ASTM F 567 is not permitted.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices until concrete is sufficiently cured.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Dimensions and Profile: As indicated on Drawings. Install concrete footings at all fence posts.
 - b. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water. Keep exposed concrete moist for at least 7 days after placement, or cured with an approved membrane curing material.
 - c. Concealed Concrete: Place top of concrete 2 inches below grade as indicated on Drawings to allow covering with surface material.
 - d. Posts Set into Sleeves in Concrete: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.

- e. Posts Set into Holes in Concrete: Form or core drill holes to depth indicated on drawings and 3/4-inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.
- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.
- E. Line Posts: Space line posts uniformly as follows:
 - 1. Standard fencing: 10 feet o.c.
 - 2. Tennis and multi-purpose court wall fencing: 10 feet o.c.
 - 3. Handball court fencing: 5 to 6 feet o.c., based on bay size.
 - 4. High Security fencing: 8 feet o.c.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:
 - 1. Extended along bottom of fence fabric. Install bottom tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- H. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- I. Intermediate Rails: where indicated, install in one piece at post-height center span, spanning between posts, using fittings, special offset fittings, and accessories.
- J. Bottom Rails: Where indicated, install and secure to posts with fittings.

- K. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2-inch bottom clearance between finish grade or surface and bottom selvage, and 1-inch unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released. Do not allow fabric to be in contact with finish grade.
- L. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.
- M. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.
- N. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.5 GROUNDING AND BONDING

- A. Comply with requirements in Section 26 05 26 "Grounding and Bonding for Electrical Systems."
- B. Fences Enclosing Electrical Power Distribution Equipment: Ground according to IEEE C2 unless otherwise indicated.
- C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- D. Connections:
 - 1. Make connections with clean, bare metal at points of contact.
 - 2. Make above-grade ground connections with mechanical fasteners.
 - 3. Make below-grade ground connections with exothermic welds.

4. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests.
- B. Prepare test reports.

3.7 TOLERANCES

- A. Maximum Offset From True Position: 1-inch.
- B. Maximum Variation From Plumb: 1/4-inch. Vertical post tolerance of 1/4-inch shall be after the fabric has been stretched.
- C. Components shall not infringe adjacent property lines.

3.8 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

3.9 GALVANIZING REPAIR

- A. Clean and repair galvanized surfaces damaged by welding or abrasion, cut ends of fabric, and other cut sections with specified galvanizing repair material applied in conformance with manufacturer's printed instructions.

3.10 DEMONSTRATION

- A. Engage a factory-authorized service representative to train District's maintenance personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION 32 31 13