CITY OF BERKELEY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECTS

PROJECT MANUAL

West Berkeley Service Center Improvement Project

SPECIFICATION NO. 21-11604-C

January, 2024

ADVERTISEMENT DATE: January 25, 2024

PRE-BID CONFERENCE: February 6, 2024

BID OPENING DATE: Thursday, February 22, 2024

Approved by:

Ronald A. Nevels
City Engineer

1947 CENTER STREET, 4th Floor, BERKELEY, CALIFORNIA 94704 (510) 981-6400

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Document 00 0101

CITY OF BERKELEY

DEPARTMENT OF PUBLIC WORKS

PROJECT MANUAL

West Berkeley Service Center Improvement Project

at

1900 Sixth Street
Berkeley, CA 94710

SPECIFICATION NO. 21-11604-C
January, 2024

Prepared By:

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ENGINEERING DIVISION
1947 CENTER STREET, 4TH FLOOR
BERKELEY, CALIFORNIA 94704

Project Manager
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Phone: (510) 981-6410
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DOCUMENT 00 1113

NOTICE INVITING BIDS

ARTICLE 1 - INVITATION TO BID

1.01 Notice Inviting Bids: City of Berkeley ("City") will receive sealed Bids at City of Berkeley, Purchasing Manager's Office, located at the Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704, Telephone (510) 981-7320, until **Thursday, February 22, 2024** for the following public work:

SPECIFICATION NO. 21-11604-C
CITY OF BERKELEY
West Berkeley Service Center Improvement Project
1900 Sixth Street

1.02 Project Description: West Berkeley Service Center Improvement Project, including ancillary work in accordance with the terms and conditions of the Contract Documents. Work shall be completed within **182** Calendar Days from the date when Contract Time commences to run.

1.03 Procurement of Bidding Documents:
Bidding Documents contain the full description of the Work. Bidders may obtain Bidding Documents by Thursday, February 22, 2024 from City of Berkeley's Public Works website under Current Construction Project Bid Opportunities:

https://berkeleyca.gov/doing-business/working-city/bid-proposal-opportunities

For information pertaining to the Bidding Documents, please contact the Project Manager, Titus Chen, 1947 Center Street, 4th Floor, Berkeley, CA 94704, by Email at tchen@berkeleyca.gov or by Telephone at (510) 981-6410 or by FAX **(510) 981-6390**.

1.04 Planholders List:

Bidders are responsible for notifying Titus Chen, via email at tchen@berkeleyca.gov to be included on the Planholders List. Please include the following in the email subject header: "Planholders list for Specification No. 21-11604-C for West Berkeley Service Center Improvement Project". In the body of the email, please state the Name of the Company Representative, Company Name, Address, Telephone Number, Fax Number, and Email Address.

1.05 Instructions: Bidders shall refer to Document 00 2113 (Instructions to Bidders) for required documents and items to be submitted in a sealed envelope for deposit into the Bid Box, located at **City of Berkeley, Purchasing Manager's Office, Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704, Telephone (510) 981-7320** no later than the time and date set forth in Paragraph 1.01 above.

1.06 Mandatory Pre-Bid Site Visit: City **will** conduct a Mandatory Pre-Bid Conference and Site Visit at 1900 Sixth Street**.** The location of work is open to the public during normal business or daylight hours. It is recommended that potential bidders visit the site independently to review site conditions prior to bid. City will conduct a Pre-Bid Conference and Site Visit at 1900 Sixth Street, at 2:00 P.M. on February 6, 2024

1.07 Bid Preparation Cost: Bidders are solely responsible for the cost of preparing their Bids.

1.08 Reservation of Rights: City specifically reserves the right, in its sole discretion, to reject any or all Bids, to re-bid, or to waive inconsequential defects in bidding not involving time, price or quality of the work. City may reject any and all Bids and waive any minor irregularities in the Bids.

ARTICLE 2 - LEGAL REQUIREMENTS

2.01 **Required Contractor's License(s):** A California **"B"** contractor's license is required to bid this contract. Joint ventures must secure a joint venture license prior to award of this Contract. Specialty work may require a specialty contractor's license, held by Bidder or a listed subcontractor.

2.02 **Bid Alternates:** Bid alternates are identified in Document 00 4113 (Bid Form). The determination of lowest bid shall be based upon: Base contract bid price only.

2.03 **Substitution of Securities:** City will permit the successful bidder to substitute securities for any retention monies withheld to ensure performance of the contract, as set forth in Document 00 6290 Escrow Agreement For Security Deposits In Lieu Of Retention and incorporated herein in full by this reference, in accordance with Section 22300 of the California Public Contract Code.

2.04 **Prevailing Wage Laws:** The successful Bidder must comply with all prevailing wage laws applicable to the Project, and related requirements contained in the Contract Documents. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at **http://www.dir.ca.gov/oprl/pwd/** and are deemed included in the Bidding Documents. The successful Bidder shall post the applicable prevailing wage rates at the Site.

2.05 **Community Workforce Agreement:** This contract will NOT be subject to the Community Workforce Agreement approved by the Berkeley City Council on June 23, 2015 (See Document 00 6580 – City of Berkeley Contracting Policies). The successful bidder and all subcontractors, at any tier, will NOT be required to sign an Agreement to be Bound as a condition precedent to entering into any contract for this project.

2.06 **First Source Construction Agreement:** This contract will NOT be subject to the First Source Construction Agreement (See Document 00 6580 – City of Berkeley Contracting Policies).

2.07 This contract **WILL** be subject to Supplementary Conditions for Federal Funding. Section 00 7201.

END OF SECTION

DOCUMENT 00 2113

INSTRUCTIONS TO BIDDERS

Bids are requested by City of Berkeley ("City"), for a general construction contract, or work described in general, as set forth in Document 00 1113 (Notice Inviting Bids), and the following additional terms.

ARTICLE 1 - PROCEDURES FOR SUBMISSION OF BIDS

1.01 Required Pre-Bid Conference and Site Visit

A. City **WILL** conduct a Mandatory Pre-Bid Conference and Site Visit at 1900 Sixth Street, at February 6, 2024. The location of work is open to the public during normal business or daylight hours. It is recommended that potential bidders visit the site independently to review site conditions prior to bid.

B. Questions regarding the site and the Bid Documents may be sent to the City's Representative to clarify such matters as Bidders may request. The Site Visit may be the Bidders' only opportunity to investigate conditions at the Site. Other Pre-Bid Site Visits may be scheduled at City's sole discretion, depending on staff availability.

C. City will issue Minutes of the Pre-Bid Conference, which shall constitute the sole and exclusive record and statement of the results of the Pre-Bid Conference. The Minutes issued by City are not Contract Documents.

1.02 Required Pre-Bid Investigations

A. Prior to submission of Bid, Bidder must conduct a careful examination of Bidding Documents and understand the nature, extent, and location of Work to be performed. Refer to Document 00 7200 (General Conditions) on required pre-bid investigations.

B. Bidders may examine any available existing conditions information (e.g., record documents, specifications, studies, drawings of previous work), as well as applicable environmental assessment information (if any) regarding the Project, which will be posted on the website location indicated in Document 00 1113 (Notice Inviting Bids), paragraph 1.03.

1.03 Bidder Questions and Answers

A. Bidders must direct all questions about the meaning or intent of Bidding Documents to City's Project Manager in writing as indicated in Document 00 1113 (Notice Inviting Bids), paragraph 1.03. Interpretations or clarifications considered necessary by City in response to such questions will be issued by written Addenda posted to the City's website.

B. Questions received less than ten (10) calendar days prior to the date for opening Bids may not be answered.

C. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect, and Bidders shall not rely on oral statements.

1.04 Addenda

A. Addenda may also be issued to modify the Bidding Documents as deemed advisable by City. Addenda shall be acknowledged by number in Document 00 4113 (Bid Form) and shall be part of the Contract Documents. A complete listing of Addenda may be secured from City on the website as indicated in Document 00 1113 (Notice Inviting Bid), paragraph 1.03.

1. It is the Contractor's responsibility to check the City's website for Addenda prior to submitting their bid.

ARTICLE 2 - RECEIPT OF BIDS

2.01 Date and Time

A. Sealed Bids will be received by the City until the date and time indicated in Document 00 1113 (Notice Inviting Bids). All Bid envelopes will be time-stamped to reflect their submittal time. City shall reject all Bids received after the specified time and will return such Bids to Bidders unopened. Bidders must submit Bids in accordance with this Document 00 2113.

2.02 Two Envelope Bid Submission:

A. City will receive Bids in opaque sealed 10 inch x 13 inch envelopes, containing the required items described herein.

B. Bidders must submit Bids in two envelopes: "Envelope A – Bid Submittals" and "Envelope B – Statement of Qualifications."

C. Bidders should mark their Bid envelopes using the name, address, identifying information and specification number, indicated in Document 00 1113 (Notice Inviting Bids).

2.03 Required Contents of "Envelope A – Bid Submittals"

A. Document 00 4113 (Bid Form). Bidders must submit Bids on Document 00 4113 (Bid Form) in accordance with the provisions of Document 00 4113. Bidders must complete all Bid items and supply all information required by Bid documents and specifications.

B. Document 00 4313 (Bond Accompanying Bid). Bidders must submit Document 00 4313 (Bond Accompanying Bid) accompanied by a cashier's check, certified check (certified without qualification and drawn on a solvent bank of the State of California or a National Bank doing business in the State of California) or completed form of Document 00 4313 of not less than 10% of the base Bid, payable to City and completed in accordance with the provisions of Document 00 4313.

C. Document 00 4314 (Bidder Registration and Experience Form). Bidders must submit Document 00 4314 (Bidder Registration and Experience Form), completed in accordance with the provisions of Document 00 4314.

D. Document 00 4330 (Subcontractor List). Bidders must submit Document 00 4330 (Subcontractors List) completed in accordance with the provisions of Document 00 4330. The Subcontractors List must include the names of all subcontractors for those subcontractors who will perform any portion of work, including labor, rendering of service, or specially fabricating and installing a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of the total Bid amount. Any violation of this requirement may result in a Bid being deemed non-responsive and not being considered.

E. Document 00 4519 (Non-Collusion Affidavit). Bidders must submit Document 00 4519 (Non-Collusion Affidavit) completed in accordance with the provisions of Document 00 4519.

F. Document 00 4546 (Bidder Certifications). Bidders must submit Document 00 4546 (Bidder Certification) completed in accordance with the provisions of Document 00 4546.

2.04 Required Contents of "Envelope B – Statement of Qualifications"

A. Document 00 4513 (Statement of Qualifications for Construction Work). Bidder must submit Document 00 4513 (Statement of Qualifications for Construction Work) in accordance with the provisions of Document 00 4513.

ARTICLE 3 - BID OPENING AND EVALUATION

3.01 Determination of Apparent Low Bidder

A. City will open each Bidders' Envelope A at the time and place indicated in Document 00 1113 (Notice Inviting Bids), initially evaluate them for responsiveness, and determine an Apparent Low Bidder as specified herein.

B. Apparent Low Bid will be determined solely on the total amount of all Bid items based on terms contained in Document 00 1113 (Notice Inviting Bids) and Document 00 4113 (Bid Form). All Bidders are required to submit Bids on all Bid items (including any alternates).

C. For the purposes of award, the apparent low Bidder will be the conforming responsible Bidder offering the lowest total amount for the Total Base Bid shown in the Bid Form. Once the low bidder is determined as herein described, the City reserves the right to award any combination of Additive Bid alternates, or not award any Additive Bid alternates, as it deems to be in the best interest of the City, regardless of whether the total bid of the particular combination selected is higher or lower than any other bidder for that same combination.

D. For the Apparent Low Bidder only, City will open Envelope B and evaluate the Apparent Low Bidder for responsiveness to the requirements of Document 00 4513 and for Responsibility.

E. If Apparent Low Bidder is determined to be non-responsive or non-responsible, then City may proceed to the next Apparent Low Bidder's Bid pursuant to any procedures determined in its reasonable discretion, and proceed for all purposes as if this Apparent Low Bidder were the original Apparent Low Bidder.

3.02 Evaluation of Bids

A. Bids must be full, complete, clearly written and using the required forms. Bidders shall make any change in the Bid by crossing out the original entry, entering and initialing the new entry. Bidder's failure to submit all required documents strictly as required entitles City to reject the Bid as non-responsive. All Bidders must submit Bids containing each of the fully executed documents supplied in this Project Manual.

B. In evaluating Bids, City will consider Bidders' qualifications, whether or not the Bids comply with the prescribed requirements, unit prices, and other data, as may be requested in Document 00 4113 (Bid Form) or prior to the Notice of Award.

C. City may conduct reasonable investigations and reference checks of Bidder and other persons and organizations as City deems necessary to assist in the evaluation of any Bid and to establish Bidder's responsibility, qualifications, financial ability and ability to perform the Work in accordance with the Contract Documents to City's satisfaction within the prescribed time. Submission of a Bid constitutes Bidder's consent to the foregoing.

D. City shall have the right to consider information provided by sources other than Bidder. City shall also have the right to communicate directly with Bidder's surety regarding Bidder's bonds.

E. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures will be resolved in favor of the words.

F. Bids shall be deemed to include the written responses of the Bidder to any questions or requests for information of City made as part of Bid evaluation process after submission of Bid.

3.03 Reservation of Rights

A. City reserves the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder as non-responsive as a result of any error or omission in the Bid, or if City believes that it would not be in the best interest of Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by City. For purposes of this paragraph, an "unbalanced Bid" is one having nominal prices for some Bid items and enhanced prices for other Bid items.

B. City may retain Bid securities and Bid bonds of other than the Apparent Low Bidder for a period of 90 Days after award or full execution of the Contract, whichever first occurs.

C. City may reject any or all Bids and waive any informalities or minor irregularities in the Bids. City also reserves the right, in its discretion, to reject any or all Bids and to re-Bid the Project.

ARTICLE 4 - MANDATORY BID PROTEST PROCEDURES

4.01 Submission of Written Bid Protest

A. Any Bid protest in connection with the construction contract or work described in general in Document 00 1113 (Notice Inviting Bids) must be submitted in writing to the Project Manager as indicated in Document 00 1113, paragraph 1.03 before 3:30 p.m. of the fifth Business Day following opening of the Bidders' envelopes.

B. The initial protest document must contain a complete statement of the basis for the protest.

C. The protest must refer to the specific portion of the document that forms the basis for the protest.

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

E. Only Bidders who the City otherwise determines are responsive and responsible are eligible to protest a Bid; protests from any other Bidder will not be considered. In order to determine whether a protesting Bidder is responsive and responsible, City may evaluate all information contained in any protesting Bidder's Bid, and conduct the same investigation and evaluation as City is entitled to take regarding an Apparent Low Bidder.

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

4.02 Exclusive Remedy

A. The procedure and time limits set forth in this paragraph are mandatory and are Bidder's sole and exclusive remedy in the event of Bid protest. Bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal proceedings. A Bidder may not rely on a protest submitted by another Bidder, but must timely pursue its own protest.

ARTICLE 5 - AWARD AND EXECUTION OF CONTRACT

5.01 Notice of Intent to Award and Submittal of Executed Contract Documents

A. If Contract is to be awarded, it will be awarded to the lowest responsible responsive Bidder. City will issue Document 00 5100 Notice of Intent to Award. Such Award, if made, will be made within sixty (60) calendar days after the opening of the Bid Proposals.

B. Successful Bidder must execute and submit to City the "Required Contract Documents and Proof of Insurance" set forth below, by 5:00 p.m. of the 10th calendar Day following the Notice of Intent to Award.

5.02 Required Contract Documents and Proof of Insurance

A. Document 00 5200 (Agreement), fully executed by successful Bidder. Submit **two** originals and an emailed PDF, each bearing an original signature (in blue ink) and initials on each page.

B. Document 00 6113.13 (Construction Performance Bond), fully executed by successful Bidder and surety, in the amount set forth in Document 00 6113.13. Submit **two** originals and an emailed PDF.

C. Document 00 6113.16 (Construction Labor and Material Payment Bond), fully executed by successful Bidder and surety, in the amount set forth in Document 00 6113.16. Submit **two** originals and an emailed PDF.

D. Document 00 6536 (Guaranty), fully executed by successful Bidder. Submit **two** originals and an emailed PDF.

E. Insurance certificates and endorsements required by Document 00 7316 (Supplementary Conditions — Insurance and Indemnification): Submit **one** original set and an emailed PDF.

F. Document 006580 (City Contracting Policies), fully executed by successful bidder. Submit **one** original set and an emailed PDF.

5.03 Failure to Execute and Deliver Documents:

A. If Bidder to whom Contract is awarded, within the period described in this Document 00 2113, fails or neglects to execute and deliver all required Contract Documents and file all required bonds, insurance certificates, and other documents, City may, in its sole discretion, rescind the award, recover on Bidder's surety bond, or deposit Bidder's cashier's check or certified check for collection, and retain the proceeds thereof as liquidated damages for Bidder's failure to enter into the Contract Documents. Bidder agrees that calculating the damages City may suffer as a result of Bidder's failure to execute and deliver all required Contract Documents would be extremely difficult and impractical and that the amount of Bidder's required Bid security shall be the agreed and presumed amount of City's damages.

B. Upon such failure to timely deliver all required Contract Documents as set forth herein, City may determine the next Apparent Low Bidder and proceed accordingly. Such Award, if made, will be made within sixty (60) calendar days after the opening of the Bid Proposals.

ARTICLE 6 - GENERAL CONDITIONS AND REQUIREMENTS

6.01 Modification of Commencement of Work:

A. City expressly reserves the right to modify the date for the Commencement of Work under the Contract and to independently perform and complete work related to Project. City accepts no responsibility to Contractor for any delays attributed to its need to complete independent work at the Site.

B. City shall have the right to communicate directly with Apparent Low Bidder's proposed performance bond surety, to confirm the performance bond. City may elect to extend the time to receive faithful performance and labor and material payment bonds.

6.02 Conformed Project Manual:

A. Following Award of Contract, City may prepare a conformed Project Manual reflecting Addenda issued during bidding, which will, failing objection, constitute the approved Project Manual.

6.03 Payment Bond:

A. If the Project described in Document 00 1113 (Notice Inviting Bids) involves an expenditure in excess of twenty-five thousand dollars ($25,000), the successful Bidder must file a payment bond with and approved by City prior to entering upon the performance of the Work, in accordance with Civil Code § 3247.

6.04 Wage Rates:

A. The successful Bidder must comply with all prevailing wage laws applicable to the Project, and related requirements contained in the Contract Documents. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at **http://www.dir.ca.gov/oprl/pwd/** and are deemed included in the Bidding Documents. The successful Bidder shall post the applicable prevailing wage rates at the Site.

6.05 Withdrawal of Bids:

A. Bidders may withdraw their Bids at any time prior to the Bid opening time fixed in this Document 00 2113, only by written request for the withdrawal of Bid filed with City's Purchasing Department, at 2180 Milvia Street, 3rd Floor, Berkeley, CA 94704. Bidder or its duly authorized representative shall execute request to withdraw Bid.

6.06 Ineligible Contractors and Subcontractors:

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

B. City shall not accept a Bid from a Bidder who is ineligible to bid or work on, or be awarded, a public works project pursuant to California Labor Code section 1777.1 or 1777.7. Bidders and the Contractor who is awarded the project contract shall not utilize, or allow work by, any subcontractor who is ineligible to bid or work on, or be awarded, a public works project pursuant to California Labor Code Section 1777.1 or 1777.7. (See California Public Contract Code Section 6109.) The California Division of Labor Standards Enforcement publishes a list of debarred contractors and subcontractors on the Internet at www.dir.ca.gov/DLSE/debar.html.

6.07 Substitutions:

A. Bidders must base their Bids on products and systems specified in Contract Documents or listed by name in Addenda. City will consider substitution requests only for "or equal items." Bidders wanting to use "or equal" item(s) may submit Document 00 6325 (Substitution Request Form) no later than 35 calendar days after Notice of Award. As a limitation on Bidder's privilege to request substitution of "or equal" items, City has found that certain items are designated as City standards and certain items are designated to match existing items in use on a particular public improvement either completed or in the course of completion or are available from one source. As to such items, City will not permit substitution. Such items are described in the Bidding Documents.

6.08 Definitions:

A. All abbreviations and definitions of terms used in this Document 00 2113 are set forth in Document 00 7200 (General Conditions) and Section 01 4200 (References and Definitions).

END OF SECTION

DOCUMENT 00 3132

GEOTECHNICAL DATA AND EXISTING CONDITIONS

ARTICLE 1 - REPORTS AND INFORMATION ON EXISTING CONDITIONS

1.01 Inspection of Reports:

A. City, its consultants, and prior contractors may have collected documents providing a general description of the Site and conditions of the Work. These documents may consist of geotechnical reports for and around the Site, contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding Underground Facilities (collectively, "Existing Conditions Data".)

B. Bidders may inspect Geotechnical and Existing Conditions Data. These documents are listed in Section 01 1100 (Summary) and are available for review at the address identified therein. Copies may be obtained for the cost of reproduction and handling upon Bidder's payment for the costs.

C. Existing Conditions Data is for information only and does not describe labor, materials or equipment furnished by Contractor, but rather, information regarding conditions of the work. Such Existing Conditions Data is not a Contract Document.

ARTICLE 2 - USE OF EXISTING CONDITIONS DATA

2.01 Above-Ground Existing Conditions:

A. City makes no warranty or representation of existing aboveground conditions, as-built conditions, or other aboveground actual conditions verifiable by reasonable independent investigation. These conditions are verifiable by Bidder by the performance of its own independent investigation that Bidder must perform prior to bidding and Bidder must not rely on the information supplied by City regarding existing conditions.

B. Bidder represents and agrees that in submitting its Bid, it is not relying on any information regarding above-ground existing conditions supplied by City.

2.02 Underground Facilities:

A. Information supplied regarding existing Underground Facilities at or contiguous to the Site is based on information furnished to City by others (e.g., the builders of such Underground Facilities or others).

B. City assumes responsibility for only the general accuracy, completeness or thoroughness of information regarding Underground Facilities that are owned by City. This express assumption of responsibility applies only if Bidder has conducted the independent investigation required of it under Document 00 7200 (General Conditions) and discrepancies were not apparent. Bidder is solely responsible for any interpretation or conclusion drawn from this information.

C. City is not responsible for information regarding Underground Facilities owned by others.

2.03 Hazardous Materials Surveys:

A. Bidders may rely on this data and information for general accuracy regarding the locations of potentially hazardous materials subject of the Work. City does not warrant and makes no representation regarding the completeness or thoroughness of any data or information regarding existing conditions or hazardous materials, including, but not limited to, quantities, characteristics, volumes, or associated structural features. Bidder represents and agrees that in submitting a Bid it is not relying on any such data, information or deductions.

B. Data and information regarding the locations of hazardous materials are not part of Contract Documents.

2.04 Geotechnical Data:

A. Bidder may rely upon the general accuracy of the "technical data" contained in the geotechnical reports and drawings identified above, but only insofar as it relates to subsurface conditions,

provided Bidder has conducted the independent investigation required of it and discrepancies were not apparent.

B. The term “technical data” shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment, or structures that were encountered during subsurface exploration. The term “technical data” does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures. The term “technical data” shall not include the location of Underground Facilities.

C. Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder is solely responsible for any interpretation or conclusion drawn from any “technical data” or any other data, interpretations, opinions, or information contained in supplied geotechnical data.

D. Except as expressly set forth in this Document 00 3132, City does not warrant, and makes no representation regarding, the accuracy or thoroughness of any geotechnical data.

E. Bidder represents and agrees that in submitting its Bid, it is not relying on any geotechnical data supplied by City, except as specifically set forth herein.

ARTICLE 3 - INVESTIGATIONS

3.01 Required Investigations:

A. Before submitting a Bid, each Bidder shall be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of Contract Documents.

B. Bidders shall advise City in writing during the Bid period of any questions, suppositions, inferences or deductions Bidders may have for City’s review and response.

C. City has provided time in the period prior to bidding for Bidder to perform these investigations.

3.02 Access to Site for Investigations:

A. During the Pre-Bid Site Visit(s), City will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. The Bidder may request alternate dates and times to access the site. Such request must be made in writing at least ten (10) calendar days prior to bid. Bidders must fill all holes and clean up and restore the Site to its former conditions upon completion of such explorations, investigations, tests, and studies. Such investigations may be performed only under the provisions of Document 00 2113 (Instructions to Bidders) and Document 00 7200 (General Conditions) including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such investigation work. Each Bidder shall supply all equipment required to perform any investigations as each Bidder deems necessary. City has the right to limit the number of pieces of machinery operating at one time due to safety concerns.

END OF SECTION

DOCUMENT 00 4113

BID FORM

TO **CITY OF BERKELEY**

THIS BID IS SUBMITTED BY:

_____

(Firm/Company Name)

Re:West Berkeley Service Center Improvement Project at 1900 Sixth Street, Specification No. 21-11604-C

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with City of Berkeley in the form included in the Contract Documents, Document 00 5200 (Agreement), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of the Contract Documents.

2. Bidder accepts all of the terms and conditions of the Contract Documents, Document 00 1113 (Notice Inviting Bids), and Document 00 2113 (Instructions to Bidders), including, without limitation, those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for 60 calendar days after the day of Bid opening, unless there is a bid protest, then 90 calendar days after the day of bid opening. Bidder will sign and submit Document 00 5200 (Agreement) and other documents required by Document 002113, paragraph 5.02 (Required Contract Documents and Proof of Insurance) within 20 calendar days after receipt of City's Notice of Intent to Award.

3. In submitting this Bid, Bidder represents that Bidder has examined all of the Contract Documents, performed all necessary Pre-Bid investigations as set forth in Document 00 5200 (Agreement) Article 6 (Contractor's Representation), received the Pre-Bid conference minutes (if any), and received the following Addenda:

Addendum Number	**ADDENDUM DATE**	**Signature of Bidder**

4. Based on the foregoing, Bidder proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Contract Documents for the following sums of money listed in the following Schedule of Bid Prices:

SCHEDULE OF BID PRICES

All Bid items, including lump sums and unit prices, must be filled in completely. Bid items are described in Section 01 1100 (Summary of Work). Quote in figures only, unless words are specifically requested.

ITEM	DESCRIPTION	PRICE ($)
1	All work of the Contract Documents, including all Deduct Alternates. Landscape work shown in sheets L1.0, L2.0, L3.0, L4.0, L6.0, L6.1, L9.0, and L9.1 is not in the scope of this contract and will be performed by others.	
2	N/A	
	Total Bid Price: **(Bid Items 1 through 2)**	

Total Bid Price: (Bid Items 1 Through 2)

_____

(Words)

Deduct Alternates

ITEM	DESCRIPTION	PRICE ($)
1	Deduct Alternate 1: All work associated with improvements to Exterior Storage #31 including, but not limited to, new walls, roof structure, roofing, new footings, and new downspouts and drainage to parking lot.	
2	Deduct Alternate 2: All work associated with the installation of new playground fencing (see Sheet A7.21) including, but not limited to, new foundations, fence structure, and entry gate.	
3	Deduct Alternative 3: All work associated with exterior fabric structure (shade sail) including, but not limited to, the structural support column, attachment to Exterior Storage #31, fabric, and mounting/tensioning hardware.	
4	Deduct Alternate 4: Exterior courtyard canopy at Alcove #17 including, but not limited to, new steel columns, column footings, roof framing, roofing, structural modifications at existing building along line 5, and modifications to existing line 5 gutter.	

5. Subcontractors for work included in all Bid items are listed on Document 00 4330 (Subcontractors List) submitted herewith.

6. The undersigned Bidder understands that City reserves the right to reject this Bid, but that this Bid shall remain open and shall not be withdrawn for a period of sixty (60) calendar days from the date prescribed for its opening.

7. If written notice of the acceptance of this Bid, hereinafter referred to as Notice of Intent to Award, is mailed or delivered to the undersigned Bidder within the time described in Paragraph 2 of this Document 00 4113 or at any other time thereafter before it is withdrawn, the undersigned Bidder will execute and deliver the documents required by Document 00 2113 (Instructions to Bidders) within the times specified therein.

8. Notice of Award or request for additional information may be addressed to the undersigned Bidder at the address set forth below.

9. The undersigned Bidder herewith encloses cash, a cashier's check, or certified check of or on a responsible bank in the United States, or a corporate surety bond furnished by a surety authorized to do a surety business in the State of California, in form specified in Document 00 2113 (Instructions to Bidders), in the amount of ten percent (10%) of the Total Bid Price and made payable to City of Berkeley.

10. The undersigned Bidder agrees to commence Work under the Contract Documents on the date established in Document 00 7200 (General Conditions) and to complete all Work within the time specified in Document 00 5200 (Agreement).

11. The undersigned Bidder agrees that, in accordance with Document 00 7200 (General Conditions), liquidated damages for failure to complete all Work in the Contract within the time specified in Document 00 5200 (Agreement) shall be as set forth in Document 00 5200.

12. The names of all persons interested in the foregoing Bid as principals are:

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, give the legal name of corporation, state where incorporated, and names of president and secretary thereof; if a partnership, give name of the firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full.

NAME OF BIDDER: _____

licensed in accordance with an act for the registration of Contractors, and with license number:_____ Expiration: _____.

_____

(Place of Incorporation, if Applicable) (Principal)

_____

(Principal)

_____

(Principal)

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

_____

(Signature of Bidder)

NOTE: If Bidder is a corporation, set forth the legal name of the corporation together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If Bidder is a partnership, set forth the name of the firm together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

Business Address: _____

_____

_____

Contractor's Representative(s): _____
(Name/Title)

_____
(Name/Title)

_____
(Name/Title)

Officers Authorized to Sign Contracts _____
(Name/Title)

_____
(Name/Title)

_____
(Name/Title)

Telephone Number(s): _____
(Area Code) (Number)

_____
(Area Code) (Number)

Fax Number(s): _____
(Area Code) (Number)

_____
(Area Code) (Number)

Date of Bid: _____

END OF SECTION

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DOCUMENT 00 4313

BOND ACCOMPANYING BID

KNOW ALL BY THESE PRESENTS:

That the undersigned

_____

,

(Name of Contractor)

as Principal and the undersigned as Surety are held and firmly bound unto City of Berkeley, as obligee, in the penal sum of _____

(Dollar Amount in Words)

Dollars **($_____)** lawful money of the United States of America being at least ten percent (10%) of the aggregate amount of said Principal _____'s base Bid, for the payment of which, well and truly to be made, we bind ourselves, our successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal is submitting a Bid for

Specification No. 21-11604-C
West Berkeley Service Center Improvement Project
at 1900 Sixth Street**.**

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Bid submitted by the said Principal be accepted and the Contract be awarded to said Principal and said Principal shall within the required periods enter into the Contract so awarded and provide the required Construction Performance Bond, Construction Labor and Material Payment Bond, insurance certificates, Guarantee, and all other endorsements, forms, and documents required under Document 00 2113 (Instructions to Bidders), then this obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument this _____ day of _____, 20___**.**
(Month)

(Corporate Seal) By _____
Principal

By _____
Surety

(Corporate Seal) By _____
Attorney in Fact

END OF SECTION

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DOCUMENT 00 4314

BIDDER REGISTRATION FORM

INSTRUCTIONS

In order to register to undertake work for City of Berkeley, Bidder **must**:

1) Fill out this registration form completely; do not leave blanks.
2) Provide certificates of insurance or a letter evidencing coverage complying with Document 00 4513 (Statement of Qualifications).

INDEPENDENT CONTRACTOR REGISTRATION

Contractor's License # _____

Date: _____ Fed I.D. # _____

Full Corporate Name of Company: _____

Street Address: _____

_____

Mailing Address: _____

_____

Phone: _____ Fax: _____

Name of Principal Contact: _____

Type of Business: _____ Sole Proprietor _____ Partnership
_____ Non-Profit 501(c)(3) _____ Corporation
_____ other (please explain:_____)

INSURANCE

Workers' Compensation:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

General Liability:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

Automobile Liability:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

All-risk Course of Construction (if applicable, as required by Document 00 7316 [Supplementary Conditions – Insurance]):

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

Professional Liability (if applicable, as required by Document 00 7316 [Supplementary Conditions – Insurance]):

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

Pollution Legal Liability Insurance (if applicable, as required by Document 00 7316 [Supplementary Conditions – Insurance]):

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

BIDDER CERTIFIES, UNDER PENALTY OF PERJURY, THAT THE FOREGOING INFORMATION IS CURRENT AND ACCURATE AND AUTHORIZES OWNER, AND ITS AGENTS AND REPRESENTATIVES TO OBTAIN A CREDIT REPORT AND/OR VERIFY ANY OF THE ABOVE INFORMATION.

_____
SIGNATURE

_____
DATE

SAFETY EXPERIENCE

The following statements as to the Bidder's safety experience are submitted with the Bid, as part thereof, and the Bidder guarantees the truthfulness and accuracy of all information.

1. List Bidder's interstate Experience Modification Rate for the last three years.

   [20__] _____ **[20__]** _____ **[20__]** _____

2. Use Bidder's last year's Cal/OSHA 200 log to fill in the following number of injuries and illnesses:

   a. Number of lost workday cases _____

   b. Number of medical treatment cases _____

   c. Number of fatalities _____

3. Employee hours worked last year _____

4. State the name of Bidder's safety engineer/manager:

Attach a resume or outline of this individual's safety and health qualifications and experience.

I CERTIFY, UNDER PENALTY OF PERJURY, THAT THE FOREGOING INFORMATION IS CURRENT AND ACCURATE AND I AUTHORIZE OWNER, AND ITS AGENTS AND REPRESENTATIVES TO OBTAIN A CREDIT REPORT AND/OR VERIFY ANY OF THE ABOVE INFORMATION.

BIDDER:

By: _____
Signature

Its: _____
Title

Date_____

END OF SECTION

DOCUMENT Error! Unknown document property name.

SUBCONTRACTORS LIST

Bidder submits the following information as to the subcontractors Bidder intends to employ if awarded the Contract.

Full Name of Subcontractor (Sub.) and Address of Mill or Shop	Sub.'s License No.	Description of Work: Reference to Bid Items	Sub.'s Bid Amount	Sub.'s Depart. Of Industrial Relations No.

(Bidder to attach additional sheets if necessary)

END OF SECTION

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DOCUMENT 00 4513
STATEMENT OF QUALIFICATIONS FOR CONSTRUCTION PROJECTS

ARTICLE 1 – GENERAL INFORMATION

1.01 Minimum Bidder Qualifications.

A. Bidders must be duly licensed in accordance with the California Business & Professions Code and have a history of work performance sufficient to meet the requirements of a responsible bidder in the California Public Contract Code Section 1104.

B. Bidders must have three (3) years experience as a continuously operating entity engaged in the performance of similar work.

C. Bidders must demonstrate successful experience with type of work of this Project, to include, within the past year, completed two (2) projects of a similar nature and complexity with a contract dollar amount of (i.) at least 75% of the amount of Bidder's Bid or (ii.) 125% of such amount in the aggregate.

1.02 Measurement.

A. Bidder's compliance with the minimum qualification requirements will be measured by Bidder's experience as an operating entity and also by the experience of the supervisory personnel who will have responsible charge of the various major components of the Work.

B. If Bidder subcontracts portions of the Work, City, in its determination of whether the minimum qualification requirements have been met, may consider the qualifications of the Subcontractor's supervisory personnel.

C. The qualifications of the Key Personnel are to be submitted with the Statement of Qualifications ("SOQ"), by providing the information described in this Document 00 4513.

ARTICLE 2 – Required Contents of SOQ Submission

2.01 Transmittal Letter

A. The Transmittal Letter shall name the proposed prime contractor, its legal structure (i.e., corporation, partnership, limited partnership, joint venture). If a joint venture or partnership is proposed, Bidder shall identify partner and/or member of the joint venture and their roles and responsibilities.

2.02 Submittals:

A. Completed Questionnaire. Bidder shall include a completed Statement of Qualification Questionnaire in the form attached to this Document 00 4513 as Attachment "A".

B. License: Evidence of a valid contractor's license and required licenses of all licensees of persons who are Key Personnel necessary to perform the Work.

C. Litigation History. Description of litigation history for the past three years, including names of involved parties, nature of dispute, and disposition.

2.03 Additional Submittals:

After bid opening, Contractor maybe required to supply the City with the following submittals upon request.

A. Resumes of Proposed Key Personnel. Bidder shall provide a resume for each named Key Personnel of Bidder, to include as necessary: Years of experience; Education - degrees, schools and years obtained; Professional Registrations; Fluency in English (Yes/No); At least two client references, including contact names, addresses and telephone numbers, and description of projects of a similar nature worked on in the past five years.

B. Audited or Reviewed Financial Statements. Include audited or reviewed financial statements for the three most recently completed fiscal years for Bidder and each member of any proposed

consorting or joint venture. Also include audited or reviewed financial statements for the three most recently completed fiscal years for any parent companies) of Bidder and each member of any proposed consortium oriole venture.

C. Surety Letter re: Capability to Provide Required Performance and Payment Bonds. Bidder shall include a letter from a surety duly licensed to do business in the State of California, having a financial rating from A.M. Best Company of A-, VIII or better, that the surety has agreed to provide Bidder with the required performance and payment bonds in accordance with the requirements set forth in Documents 00 6113.13 (Construction Performance Bond) and 00 6113.16 (Construction Labor and material Payment bold), each in the penal sum of the Contractor's bid when submitted. Owner shall have the right to verify with the surety that the surety, based upon the Bid prices, will issue the required bonds under the conditions stated.

D. Insurer Letter re: Capability to Provide the Required Insurance. Bidder shall provide a letter from an insurance underwriter, having a financial rating reasonably acceptable to City, confirming that the insurer will provide Bidder the required coverages and amounts specified in the Contract Documents.

E. Description of Human and Physical Resources. Bidder shall identify, describe, and quantify for itself, the following technical information for the construction work: Description and location of manufacturing facilities, naming products and quantifying production capacity and current demand; Description of field organization(s), naming skills and equipment; Description of safety program quality control procedures, and safety experience.

2.04 Format.

A. The SOQ shall be clear and concise to enable management-oriented personnel to make a thorough evaluation and arrive at a sound determination as to whether the SOQ meet City's requirement. To this end, the SOQ should be so specific, detailed and complete as to demonstrate clearly and fully that the Bidder has a thorough understanding of and has demonstrated knowledge of the requirements to perform the Work (or applicable portion thereof).

B. Any explanation requested by a Bidder regarding the meaning or interpretation of this Document 00 4513 must be requested in writing and with sufficient time allowed for a reply to reach Bidder before the submission of its SOQ. Oral explanations or instructions will not be binding. Any information provided to any prospective Bidder concerning this Document 00 4513 will be furnished to all prospective Bidders as an Addendum to the Bidding Documents.

STATEMENT OF QUALIFICATION QUESTIONNAIRE FOLLOWS ON NEXT PAGE

ATTACHMENT "A" – STATEMENT OF QUALIFICATION QUESTIONNAIRE

Bidders shall complete the entire Statement of Qualification Questionnaire and submit it in accordance with Document 00 2113 (Instructions to Bidders) and Document 00 4513 (Statement of Qualifications). Failure to complete the questionnaire or inclusion of any false statement(s) shall be ground for immediate disqualification.

CONTACT INFORMATION

Company Name: _____

Owner of Company: _____

Contact Person: _____

Address: _____

Phone: _____ Fax: _____

PART A: GENERAL INFORMATION

1. Does Bidder possess a valid and current California Contractor's license for the work proposed? Yes ___ No ___

2. Does Bidder have a minimum of **$2,000,000** liability insurance coverage? Yes ___ No ___

3. Has Bidder's License been revoked at any time in the last five years? Yes ___ No ___

4. Has Bidder been "default terminated" by an Owner (other than for convenience), or has a Surety completed a contract for Bidder within the last five years? Yes ___ No ___

5. Has Bidder been convicted more than twice for failure to pay prevailing wages in the last three years? Yes ___ No ___

6. Will Bidder provide copies of its reviewed or audited financial statements and accompanying notes for the last three years, if requested? Yes ___ No ___

Bidder may be disqualified if any answer to questions 1, 2, or 6 is No.
Bidder may be disqualified if any answer to questions 3, 4, or 5 is Yes.

PART B: SAFETY, PREVAILING WAGE, DISPUTES AND BONDS

(SAFETY)

1. Has Cal/OHSA, Federal OSHA, the EPA or any Air Quality Management Owner cited Bidder in the past five years?
   Yes ___ No ___ If yes, attach description of each citation.

2. How often does Bidder require documented safety meetings be held for:

Field Supervisor	Weekly _____	Bi-Weekly _____	Monthly _____	Less Than Monthly _____
Employees	Weekly _____	Bi-Weekly _____	Monthly _____	Less Than Monthly _____
New Hires	Weekly _____	Bi-Weekly _____	Monthly _____	Less Than Monthly _____
Subcontractors	Weekly _____	Bi-Weekly _____	Monthly _____	Less Than Monthly _____

3. How often does Bidder conduct documented safety inspections?
   Quarterly _____ Semi-annually _____ Annually _____ Other _____

4. Does Bidder have home office safety representatives who visit/audit the job site?
   Quarterly _____ Semi-annually _____ Annually _____ Other _____

5. What is Bidder's Interstate Experience Modification Rate? _____. (A rating in excess of ***[1]*** may constitute grounds for disqualification as non-responsible).

(PREVAILING WAGE PROVISIONS)

6. Has Bidder been fined, penalized or otherwise found to have violated any prevailing wage or labor code provision? If yes, attach description of each occurrence.
   Yes _____ No _____

(LICENSE PROVISIONS)

7. Has Bidder changed names or license numbers in the past 5 years? If so, please state reason for change.
   Yes _____ No _____ Reason: _____

   _____

(DISPUTES)

8. Has Bidder had any claims, litigation, or disputes ending in mediation or arbitration, or termination for cause associated with any project in the past 5 years? If yes, attach description of each instance including details of total claim amount, settlement amount, and Owner's name and phone number.
   Yes _____ No _____

(BONDING)

9. Bonding Capacity – Provide documentation from Bidder's surety identifying the following:
   Name of bonding company/surety: _____

   Name of Surety Agent: _____

   Surety Agent address: _____

   Surety Agent phone number: _____

   Is surety a California-admitted surety? Yes _____ No _____

   Is surety listed in the current edition of the California Department of the Treasury's Listing of approved sureties? Yes _____ No _____

   List surety's A.M. Best Rating: _____

   What is Bidder's total bonding capacity? _____

   What percent does Bidder pay for bonds? _____

PART C: EXPERIENCE OF PRIME CONTRACTOR

The nature of this Project requires prior similar experience for the firm and the Key Personnel assigned. Summarize similar project experience below and provide the detailed project information requested:

Prime Contractor. List three projects of similar size and scope to the Work of the Contract, completed in the past two (2) years, and indicate who were the superintendent, project manager and scheduler. NOTE: this listing will be used to assess compliance with the stated minimum qualifications in Section 1.01.

Project Name	Construction Cost ($)	Year Completed	Name of Project Superintendent	Name of Project Manager	Name of Project Scheduler

List Key Personnel that will be assigned to the Work of the current Project and their experience/training with the projects listed above:

Project Manager: _____

Project Superintendent: _____

Project Scheduler: _____

Recent Projects.

Provide information about three (3) of its most currently completed projects. Names and references must be current and verifiable. This listing will be used to assess compliance with the stated minimum qualifications in Section 1.01. If a separate sheet is used, it must contain all of the following information:

1. Project Name: _____

   Location: _____

   Owner: _____

   Owner Contact (name and phone): _____

   Architect/Engineer: _____

   Architect/Engineer Contact (name and phone number): _____

   Const. Mgr. or Project Mgr. (name and phone number): _____

   Description of Project, Scope of Work Performed: _____

   _____

   Total Construction Cost: _____

   Total Change Order Amount: _____

   Did Change Orders exceed 10% of original contract sum? _____ If yes, please explain on separate sheet.

   Original Scheduled Date of Completion: _____

   Time Extensions Granted (number of calendar days): _____

   Actual Date of Completion: _____

   Number of Stop Notices filed by Subcontractors or Suppliers: _____

2. Project Name: _____

   Location: _____

   Owner: _____

   Owner Contact (name and phone): _____

   Architect/Engineer: _____

   Architect/Engineer Contact (name and phone number): _____

   Const. Mgr. or Project Mgr. (name and phone number):_____

   Description of Project, Scope of Work Performed: _____

   _____

Total Construction Cost: _____

Total Change Order Amount: _____

Did Change Orders exceed 10% of original contract sum? _____ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of calendar days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

3. Project Name: _____

Location: _____

Owner: _____

Owner Contact (name and phone): _____

Architect/Engineer: _____

Architect/Engineer Contact (name and phone number): _____

Const. Mgr. or Project Mgr. (name and phone number): _____

Description of Project, Scope of Work Performed: _____

_____

Total Construction Cost: _____

Total Change Order Amount: _____

Did Change Orders exceed 10% of original contract sum? _____ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of calendar days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

PART D: FINANCIAL INFORMATION

1. Has Bidder ever reorganized under the protection of bankruptcy laws?
   Yes _____ No _____ If yes, please state when _____

2. If Bidder has had the general liability carrier identified in Document 00 4314 (Bidder Registration and Safety Experience Form) for less than 5 years, please provide additional information below for balance of the last 5 years:

   Agency Name: _____

   Contact Name: _____

   Phone Number _____

   Carrier: _____ A.M. Best Rating: _____

   Carrier: _____ A.M. Best Rating: _____

   Carrier: _____ A.M. Best Rating: _____

3. Has Bidder ever had insurance terminated by a carrier? Yes _____ No _____
   If yes, explain on a separate signed sheet marked with correlating cross-reference to this paragraph of the questionnaire.

Bidder hereby declares under penalty of perjury that all the information provided in this questionnaire is true and correct.

_____
SIGNATURE

_____
TITLE

END OF SECTION

DOCUMENT 00 4519

NON-COLLUSION AFFIDAVIT

PUBLIC CONTRACT CODE §7106

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

STATE OF CALIFORNIA)
) ss.
COUNTY OF)

_____, being first duly sworn,
(Name of Principal of Bidder)

deposes and says that he or she is _____
(Office of Affiant)

of _____, the party
(Name of Bidder)

making the foregoing Bid, that the Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or sham; that Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham Bid, and has not directly or indirectly colluded, conspired, connived or agreed with any bidder or anyone else to put in a sham Bid, or that anyone shall refrain from bidding, and that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the Bid price of Bidder or any other bidder, or to fix any overhead, profit or cost element of the Bid price, or of that of any other bidder, or to secure any advantage against City , or anyone interested in the proposed contract; that all statements contained in the Bid are true; and further, that Bidder has not, directly or indirectly, submitted its Bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, Bid depository, or to any member or agent thereof to effectuate a collusive or sham Bid.

Executed under penalty of perjury under the laws of the State of California:

_____
(Name of Bidder)

_____
(Signature of Principal)

Subscribed and sworn before me _____

This _____ day of _____, 20___

Notary Public of the State of _____

In and for the County of_____

My Commission expires_____ (Seal)

NOTE: If Bidder is a partnership or a joint venture, this affidavit must be signed and sworn to by every member of the partnership or venture.

NOTE: If Bidder [including any partner or venturer of a partnership or joint venture] is a corporation, this affidavit must be signed by the Chairman, President, or Vice President and by the Secretary, Assistant Secretary, Chief Financial Officer, or Assistant Treasurer.

NOTE: If Bidder's affidavit on this form is made outside the State of California, the official position of the person taking such affidavit shall be certified according to law.

END OF SECTION

DOCUMENT 00 4546

BIDDER CERTIFICATIONS

TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

The undersigned Bidder certifies to City as set forth in sections 1 through 5 below.

1. STATEMENT OF CONVICTIONS

By my signature hereunder, I hereby swear, under penalty of perjury, that no more than one final, unappealable finding of contempt of court by a Federal Court has been issued against Bidder within the past two years because of failure to comply with an order of a Federal Court or to comply with an order of the National Labor Relations Board.

2. CERTIFICATION OF WORKER'S COMPENSATION INSURANCE

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

3. CERTIFICATION OF PREVAILING WAGE RATES AND RECORDS

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Section 1773 of the California Labor Code, which requires the payment of prevailing wage on public projects. Also, that the Contractor and any subcontractors under the Contractor shall comply with California Labor Code §1776, regarding wage records, and with California Labor Code §1777.5, regarding the employment and training of apprentices. It is the Contractor's responsibility to ensure compliance by any and all subcontractors performing work under this Contract.

4. CERTIFICATION OF COMPLIANCE WITH PUBLIC WORKS CHAPTER OF LABOR CODE

By my signature hereunder, as the Contractor, I certify that I am aware of Sections 1777.1 and 1777.7 of the California Labor Code and Contractor and Subcontractors and am eligible to bid and work on public works projects.

5. CERTIFICATION OF ADEQUACY OF CONTRACT AMOUNT

By my signature hereunder, as the Contractor, pursuant to Labor Code Section 2810(a), I certify that, if awarded the Contract based on the undersigned's Bid, the Contract will include funds sufficient to allow the Contractor to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided. I understand that Owner will be relying on this certification if it awards the Contract to the undersigned.

BIDDER: _____
(Name of Bidder)

Date: _____, **[20]** By: _____
(Signature)

Name: _____
(Print Name)

Its: _____
(Title)

END OF SECTION

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DOCUMENT 00 5100

NOTICE OF INTENT TO AWARD

Dated _____

TO: _____

ADDRESS: _____

CONTRACT NO.: _____

CONTRACT FOR: City of Berkeley
West Berkeley Service Center Improvement Project AT 1900 Sixth Street, Berkeley, CA 94710.

The Contract Sum of your contract is _().

1. Two copies of the proposed Contract Documents listed below accompany this Notice of Award.

2. You must comply with the following conditions precedent by **5:00 p.m.** of the **20th Day** following the date of this Notice of Award, that is, by .

   a. Deliver to Owner **two** fully executed counterparts and an emailed PDF copy of Document 00 5200 (Agreement). Each copy of Document 00 5200 (Agreement) must bear your original signature on the signature page and your initials on each page.

   b. Deliver to Owner **two** originals and an emailed PDF of Document 00 6113.13 (Construction Performance Bond), executed by you and your surety.

   c. Deliver to Owner **two** originals and an emailed PDF of Document 00 6113.16 (Construction Labor and Material Payment Bond), executed by you and your surety.

   d. Deliver to Owner **two** original copies and an emailed PDF of Document 00 6536 (Guaranty), each executed by you.

   e. Deliver to Owner **one** original set and an emailed PDF of the insurance certificates with endorsements required under Document 00 7316 (Supplementary Conditions – Insurance).

   f. Deliver to Owner **one** original copy and an emailed PDF of all documents found in Document 00 6580 (City of Berkeley Contracting Policies) executed by you.

3. Failure to comply with these conditions within the time specified will entitle Owner to consider your Bid abandoned, to annul this Notice of Award, and to declare your Bid security forfeited.

4. Within 21 calendar days after you comply with the conditions in Paragraph 2 of this Document 00 5100, Owner will return to you one fully signed counterpart of Document 00 5200 (Agreement) with [number] copies of the Project Manual (including Specifications and Drawings) and [number] sets of full-size Drawings.

5. Before you may start any Work at the Site, you must attend a preconstruction conference. The preconstruction conference may be arranged through **Titus Chen (510) 981-6410.** Questions regarding

bonds and insurance may be directed to **Titus Chen** at the same number. All other inquiries regarding the Project should be directed to **Titus Chen.**

6. Upon commencement of the Work, you and each of your Subcontractors shall certify and provide Owner copies of payroll records on forms provided by the Division of Labor Standards Enforcement, in accordance with California Labor Code §1776.

OWNER

BY: _____
(Title)

_____
(Print Name)

ATTEST: _____
Secretary

_____
(Print Name)

AUTHORIZED BY **[CITY / COUNTY / DISTRICT]** RESOLUTION:

NO: _____

ADOPTED: _____, **[20___]**

[Copy of Resolution Attached]

END OF DOCUMENT

DOCUMENT 00 5200

AGREEMENT

THIS AGREEMENT, dated this **[date]** day of **[Month], [20___]**, by and between whose place of business is located at ("Contractor"), and **City of Berkeley** ("City"), acting under and by virtue of the authority vested in Owner by the laws of the State of California.

SPECIFICATION NUMBER 21-11604-C

West Berkeley Service Center Improvement Project
at
1900 Sixth Street

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth, Contractor and City agree as follows:

ARTICLE 1 – SCOPE OF WORK OF THE CONTRACT

1.01 WORK OF THE CONTRACT

A. Contractor shall complete all Work specified in the Contract Documents, in accordance with the Specifications, Drawings, and all other terms and conditions of the Contract Documents (**Work**).

1.02 PRICE FOR COMPLETION OF THE WORK

A. City shall pay Contractor the following Contract Sum for completion of Work in accordance with Contract Documents as follows: [HERE INSERT LUMP SUM, UNIT PRICES, OR CONTRACTOR'S BID IN WORDS AND NUMBERS]

B. The Contract Sum includes all allowances (if any).

ARTICLE 2 – COMMENCEMENT AND COMPLETION OF WORK

2.01 COMMENCEMENT OF WORK

A. Contractor shall commence Work on the date established in the Notice to Proceed (**Commencement Date**).

B. City reserves the right to modify or alter the Commencement Date.

2.02 COMPLETION OF WORK

A. Contractor shall achieve Substantial Completion of the entire Work within **182** calendar days from the Commencement Date.

B. Contractor shall achieve Final Completion of the entire Work **203** calendar days from the Commencement Date.

ARTICLE 3 – PROJECT REPRESENTATIVES

3.01 CITY'S PROJECT MANAGER

A. City has designated Titus Chen as its Project Manager to act as City's Representative in all matters relating to the Contract Documents.

B. Project Manager shall have final authority over all matters pertaining to the Contract Documents and shall have sole authority to modify the Contract Documents on behalf of City, to accept work, and to make decisions or actions binding on City, and shall have sole signature authority on

behalf of City.

C. City may assign all or part of the Project Manager's rights, responsibilities and duties to a Construction Manager, or other City Representative.

3.02 CONTRACTOR'S PROJECT MANAGER

A. Contractor has designated **[_____ or other]** as its Project Manager to act as Contractor's Representative in all matters relating to the Contract Documents.

3.03 ARCHITECT/ENGINEER

A. **NOLL & TAM ARCHITECTS** furnished the Plans and Specifications and shall have the rights assigned to Architect/Engineer in the Contract Documents.

B. Architect/Engineer has designated **Tom Beil** as its project manager, to act as its representative for receiving and making communications authorized under the Contract Documents.

ARTICLE 4 – LIQUIDATED DAMAGES FOR DELAY IN COMPLETION OF WORK

4.01 LIQUIDATED DAMAGE AMOUNTS

A. As liquidated damages for delay, Contractor shall pay City one thousand two hundred dollars ($4,200.00) for each Day that expires after the time specified herein for Contractor to achieve Substantial Completion of the entire Work, until achieved.

B. As liquidated damages for delay, Contractor shall pay City one thousand two hundred dollars ($4,200.00) for each Day that expires after the time specified herein for Contractor to achieve Final Completion of the entire Work, until achieved.

4.02 SCOPE OF LIQUIDATED DAMAGES

A. Measures of liquidated damages shall apply cumulatively.

B. Limitations and stipulations regarding liquidated damages are set forth in Document 00 7200 (General Conditions).

ARTICLE 5 – CONTRACT DOCUMENTS

5.01 Contract Documents consist of the following documents, including all changes, Addenda, and Modifications thereto:

Document 00 5100	Notice of Award
Document 00 5200	Agreement
Document 00 5500	Notice to Proceed
Document 00 6113.13	Construction Performance Bond
Document 00 6113.16	Construction Labor and Material Payment Bond
Document 00 6536	Guaranty
Document 00 6530	Release of Claims
Document 00 6325	Substitution Request Form
Document 00 6290	Escrow Agreement for Security Deposits
Document 00 6580	City of Berkeley Contracting Policies
Document 00 7200	General Conditions
Document 00 7201	Supplementary Conditions
Document 00 7316	Supplementary Conditions – Insurance
Document 00 7319	Supplemental Conditions – Hazardous Materials
Document 00 7380	Apprenticeship Programs
Document 00 9113	Addenda [LIST ADDENDA ISSUED]

Specifications Divisions 1 through 9

Maps, Drawings and Sketches listed in Document 00 0115

5.02 There are no Contract Documents other than those listed above. The Contract Documents may only be amended, modified or supplemented as provided in Document 00 7200 (General Conditions).

ARTICLE 6 – CONTRACTOR'S REPRESENTATIONS

In order to induce City to enter into this Agreement, Contractor makes the following representations and warranties:

6.01 Contractor has visited the site and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto.

6.02 Contractor has examined thoroughly and understood all reports of exploration and tests of subsurface conditions, as-built drawings, drawings or reports, available for Bidding purposes, of physical conditions, including Underground Facilities, identified in the Bid Documents, or which may appear in the Drawings, and accepts the determination set forth in these documents and Document 00 7200 General Conditions of the limited extent of the information contained in such reports and drawings upon which the Contractor may be entitled to rely. Contractor agrees that except for the information so identified, Contractor does not and shall not rely on any other information contained in such reports and drawings.

6.03 Contractor has conducted or obtained and has understood all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in Article 6.02 above) which pertain to the subsurface conditions, as-built conditions, Underground Facilities and all other physical conditions at or contiguous to the site or otherwise which may affect the cost, progress, performance or furnishing of Work, as Contractor considers necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, test, reports, studies or similar information or data are or will be required by Contractor for such purposes.

6.04 Contractor has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

6.05 Contractor has given the Project Manager prompt written notice of all conflicts, errors, ambiguities or discrepancies that it has discovered in or among the Contract Documents and as-built and actual conditions and the written resolution thereof through Addenda issued by Project Manager is acceptable to Contractor.

ARTICLE 7 – MISCELLANEOUS

7.01 Terms and abbreviations used in this Agreement are defined in Document 00 7200 (General Conditions) and Section 01 4200 (References and Definitions) and will have the meaning indicated therein.

7.02 It is understood and agreed that in no instance are the persons signing this Agreement for or on behalf of City or acting as an employee, agent, or representative of City, liable on this Agreement or any of the Contract Documents, or upon any warranty of authority, or otherwise, and it is further understood and agreed that liability of City is limited and confined to such liability as

authorized or imposed by the Contract Documents or applicable law.

7.03 In entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. §15) or under the Cartwright Act (Chapter 2 (commencing with §16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time City tenders final payment to Contractor, without further acknowledgment by the parties.

7.04 Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are deemed included in the Contract Documents and on file at Owner's Office, and shall be made available to any interested party on request. Pursuant to California Labor Code §§ 1860 and 1861, in accordance with the provisions of Section 3700 of the Labor Code, every contractor will be required to secure the payment of compensation to his employees. Contractor represents that it is aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor shall comply with such provisions before commencing the performance of the Work of the Contract Documents.

7.05 No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded a contract for public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

7.06 This Agreement and the Contract Documents shall be deemed to have been entered into in the County of Alameda, State of California, and governed in all respects by California law (excluding choice of law rules). The exclusive venue for all disputes or litigation hereunder shall be in the Superior Court for the County of Alameda.

IN WITNESS WHEREOF the parties have executed this Agreement in triplicate the day and year first above written.

CITY OF BERKELEY

By:_____
City Manager

_____
(Print Name)

By: _____
(Signature)

Its: _____
Title (If Corporation: Chairman, President or Vice President)

Attest:
CITY OF BERKELEY

_____
City Clerk

_____
(Print Name)

By: _____
(Signature)

Its: _____
Title (If Corporation: Secretary, Assistant Secretary, Chief Financial Officer or Assistant Treasurer)

Pre-approved as to form:
CITY ATTORNEY
8/2016

END OF DOCUMENT

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DOCUMENT 00 5500

NOTICE TO PROCEED

Dated: _____, 20___

To: _____
(Contractor)

Address: _____

_____

CONTRACT FOR: **City of Berkeley West Berkeley Service Center Improvement Project AT 1900 Sixth Street**

CONTRACT NO: XXXXXX

You are notified that the Contract Time under the above Contract will commence to run on _____ **[20___]**. On that date, you are to start performing your obligations with respect to Work at the Site under the Contract Documents. In accordance with Article 2 of Document 00 5200 (Agreement), the dates of Substantial Completion and Final Completion for the entire Work are _____,**[20___]** and _____, **[20___]**, respectively.

Before you may start any Work at the Site, you must:

1. Submit certified Safety Program and related information
2. Submit copies of applicable permits
3. Submit approved fire protection plan, if applicable
4. **[Other]**

OWNER

By: _____

Its: _____

END OF DOCUMENT

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DOCUMENT 00 6113.13

CONSTRUCTION PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

1.01 THAT WHEREAS, **City of Berkeley** ("City"), a public agency of the State of California, has awarded to as Principal, Specification Number **21-11604-C,** dated the ___ day of _____, 20___ (the "Contract"), titled West Berkeley Service Center Improvement Project in the amount of , which Contract is by this reference made a part hereof, for the work of the following Contract:

(Describe Contract Work) _____

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

1.03 NOW, THEREFORE, we, the undersigned Principal and **(Name of Surety)** _____ as Surety are held and firmly bound unto City in the sum of 100% OF THE CONTRACT PRICE to be paid to City 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.

1.04 THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by City, 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 City, 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 City 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.

1.05 No extension of time, change, alteration, modification, or addition to the Contract, or of the work required thereunder, or work or actions by City to mitigate the damages resulting from any breach in performance by Contractor, 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.

1.06 Whenever Principal shall be and declared by City in default under the Contract, Surety shall promptly remedy the default, or shall promptly, and in no event later than thirty (30) calendar days from notice:

A. Undertake through its agents or independent contractors (but having qualifications and experience reasonably acceptable to City, 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, indemnities, and the payment of liquidated damages; or

B. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and, upon determination by City of the lowest responsible bidder, arrange for a contract between such bidder and City 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 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 City to the Principal under the Contract and any amendments thereto, less the amount paid by City to Principal.

1.07 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 City's rights against the others.

1.08 Surety may not use Contractor to complete the Contract absent City's Consent. City shall have the right in its sole discretion to continue the work of the Contract, as necessary following a default and/or termination, as necessary to prevent risks of personal injury, property damage or delay to the Project.

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

1.10 Surety shall join in any proceedings brought under the Contract upon City's demand, and shall be bound by any judgment.

1.11 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____.

CONTRACTOR AS PRINCIPAL	**SURETY**
Company: (Corp. Seal)	Company: (Corp. Seal)
Signature:_____	Signature:_____
Name and Title:_____	Name and Title:_____
Address:_____	Address:_____
_____	_____
_____	_____

END OF DOCUMENT

DOCUMENT 00 6113.16

CONSTRUCTION LABOR AND MATERIAL PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS:

1.01 THAT WHEREAS, City of Berkeley ("City") has awarded to_ as Principal, Specification No. **21-11604-C** dated the _____ day of _____**,** 20__ (the "Contract"), titled West Berkeley Service Center Improvement Project in the amount of , which Contract is by this reference made a part hereof, for the work of the following Contract:

(**Describe Contract Work)** _____

1.02 AND WHEREAS, Principal is required to furnish a bond in connection with the Contract to secure the payment of claims of laborers, mechanics, material suppliers, and other persons as provided by law;

1.03 NOW, THEREFORE, we, the undersigned Principal and **(Name of Surety)** _____ , as Surety, are held and firmly bound unto City in the sum of 100% OF THE CONTRACT PRICE **($)**, 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.

1.04 THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its executors, administrators, successors, or assigns approved by City, or its subcontractors shall fail to pay any of the persons named in California Civil Code §3181, or amounts due under the State of California Unemployment Insurance Code with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the State of California Employment Development Department from the wages of employees of Principal and subcontractors pursuant to Section 13020 of the State of California Unemployment Insurance Code with respect to such work and labor, that Surety will pay for the same in an amount not exceeding the sum specified in this bond, plus reasonable attorneys' fees, otherwise the above obligation shall become and be null and void.

1.05 This bond shall inure to the benefit of any of the persons named in California Civil Code §3181, as to give a right of action to such persons or their assigns in any suit brought upon this bond. The intent of this bond is to comply with the California Mechanic's Lien Law.

1.06 Surety, for value received, hereby expressly agrees that no extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder, shall in any way affect the obligation of this bond; and it does hereby waive notice of any such extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder.

1.07 Surety's obligations hereunder are independent of the obligations of any other surety for the payment of claims of laborers, mechanics, material suppliers, and other persons in connection with 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 Owner's rights against the other.

1.08 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___.

CONTRACTOR AS PRINCIPAL	**SURETY**
Company: (Corp. Seal)	Company: (Corp. Seal)
_____	_____
Signature	Signature
_____	_____
Name	Name
_____	_____
Title	Title
_____	_____
Street Address	Street Address
_____	_____
City, State, Zip Code	City, State, Zip Code

END OF DOCUMENT

DOCUMENT 00 6290

ESCROW AGREEMENT FOR SECURITY DEPOSIT IN LIEU OF RETENTION

California Public Contract Code §22300

THIS ESCROW AGREEMENT ("Escrow Agreement") is made and entered into this _____ day of _____, 20___, by and between City of Berkeley ("City"), whose address is 2180 Milvia Street, Berkeley, California 94704, _ ("Contractor"), whose place of business is located at and _____ **(Name)**, as escrow agent **OR [ ] (Name of Bank)** _____, a state or federally chartered bank in the State of California, whose place of business is located at _____ ("Escrow Agent").

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

1. Pursuant to California Public Contract Code §22300, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by City pursuant to Contract Number _____ entered into between City and Contractor for West Berkeley Service Center Improvement Project located at **1900 Sixth Street, Berkeley, CA 94710** in the amount of_____ dated _____, 20___ (the "Contract"). Alternatively, on written request of Contractor, City shall make payments of the retention earnings directly to Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify City within ten calendar days of the deposit. The market value of the securities at the time of substitution shall be at least equal to the cash amount then required to be withheld as retention under terms of Contract between Owner and Contractor. Securities shall be held in name of _____, and shall designate Contractor as the beneficial owner.

2. City shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified in Paragraph 1 of this Document 00 6290.

3. When City makes payment(s) of retention earned directly to Escrow Agent, Escrow Agent shall hold said payment(s) for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when City pays Escrow Agent directly.

4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of City. Such expenses and payment terms shall be determined by Owner, Contractor, and Escrow Agent.

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

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

7. City shall have the right to draw upon the securities in event of default by Contractor. Upon seven (7) calendar days written notice to Escrow Agent from City of the default, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by City.

8. Upon receipt of written notification from City certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract,

Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

9. Escrow Agent shall rely on written notifications from City and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Document 00 6290 and City and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth.

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

ON BEHALF OF CITY:

_____
Title

_____
Name

_____
Signature

_____
Address

_____
City/State/Zip Code

ON BEHALF OF CONTRACTOR:

_____
Title

_____
Name

_____
Signature

_____
Address

_____
City/State/Zip Code

ON BEHALF OF ESCROW AGENT:

_____
Title

_____
Name

_____
Signature

_____
Address

_____
City/State/Zip Code

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

CITY

_____

_____
Title

_____
Name

_____
Signature

CONTRACTOR

_____

_____
Title

_____
Name

_____
Signature

ATTEST

_____
Signature

_____
Print Name

City Clerk

ESCROW AGENT

_____

_____
Title

_____
Print Name

_____
Signature

Pre-approved as to form:
CITY ATTORNEY
8/2016

At the time the Escrow Account is opened, City and Contractor shall deliver to Escrow Agent a fully executed counterpart of this Document 00 6290.

END OF DOCUMENT

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DOCUMENT 00 6325

SUBSTITUTION REQUEST FORM

To: **[_____, Project Manager, City of Berkeley]**

[(____) ____-____]

PROJECT: **City's Specification No. :**	**Contractor:**

Substitution Request By:	Firm:

Transmittal Record	**Attn:**	**Firm:**	**Date Sent:**	**Date Rec'd:**	**Date Due:**
Contractor to City					
Contractor to Architect					
City / Architect to Consultant					
Architect to City Representative					
City Representative to Contractor					

We hereby submit for your consideration the following product instead of the specified item for the Project:

Section / Drawing	**Article**	**Specified Item**
Proposed Substitution:		

We have (a) attached manufacturer's literature, including complete technical data and laboratory test results, if applicable, (b) attached an explanation of why proposed substitution is a true equivalent to specified item, (c) included complete information on changes to Contract Documents that the proposed substitution will require for its proper installation, and (d) filled in the blanks below:

Contractor to complete questions that follow and certifies to the accuracy of all answers:

A.	Does the substitution affect dimensions shown on Drawings? Yes __ / No __. If No, please explain proposed mitigation and why substitution is equivalent to originally specified item:
B.	Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by the requested substitution? Yes __ / No __. If No, please state reasons explain why substitution is equivalent to originally specified item:
C.	What effect does the substitution have on other trades? No effect: __ / Some effect__. If substitution will affect other trades, please explain the effect and why substitution is equivalent to originally specified item:
D.	Will substitution cause change to Project Schedule, or to critical delivery dates? Add? Shorten? If the substitution will add to schedule dates or affect critical activities, please explain why substitution is equivalent to originally specified item:
E.	Please describe differences between proposed substitution and specified item? Please explain and identify any and all differences, and please explain why substitution is equivalent to originally specified item:
F.	What is the Cost Differential to Contractor in original specified item and proposed substitution including all mark-ups? [If substitution requested during bid period, skip this question.]
G.	Are Manufacturer's guarantees for the proposed item the same as for item specified? Yes ____; No____. If No, please explain why substitution is equivalent to originally specified item:

H.	Contractor accepts full responsibility for delays caused by redesign of other items of the Work necessitated by substitution? Yes __ / No __. If No, please state reasons and explain why substitution is equivalent to originally specified item:
I.	Contractor states that the function, appearance and quality are equivalent or superior to the specified item? Yes __ / No __. If No, please explain why substitution is equivalent to originally specified item:

We certify that the function, appearance, and quality of the proposed substitution are equivalent or superior to those of the specified item, except as we may specifically state otherwise in this request.

Submitted by:_____ Signature: _____

Firm:_____ Date: _____

Address:_____ Phone/ Fax: _____

Remarks:_____

Consultant Response:	**City Representative Response:**
o Accepted	o Accepted
o Not Accepted	o Not Accepted
o Accepted As Noted	o Accepted As Noted
o Received Too Late	o Received Too Late
Remarks:_____	**Remarks:**_____
_____	_____
By:_____	**By:**_____

END OF DOCUMENT

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DOCUMENT 00 6530

AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS

[Public Contract Code § 7100]

THIS AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS ("Agreement and Release"), made and entered into this _____ day of _____, **20**___, by and between City of Berkeley ("City"), and ("Contractor"), whose place of business is at .

RECITALS

A. City and Contractor entered into Contract Number **XXXXXX** (the "Contract") for construction of City **West Berkeley Service Center Improvement Project** located at **1900 Sixth Street,** California.

B. The Work under the Contract has been completed.

AGREEMENT

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

1. Contractor will not be assessed liquidated damages except as detailed below:

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

2. Subject to the provisions of this Agreement and Release, Owner will forthwith pay to Contractor the sum of [($)] under the Contract, less any amounts withheld under the Contract or represented by any Notice to Withhold Funds on file with City as of the date of such payment.

3. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against City arising from the Contract, except for the claims described in Paragraph 4 of this Document 00 6530. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against City, and all if its agents, employees, consultants, inspectors, representatives, assignees and transferees, except for the Disputed Claims set forth in Paragraph 4 of this Document 00 6530. Nothing in this Agreement and Release shall limit or modify Contractor's continuing obligations described in Paragraph 6 of this Document 00 6530.

4. The following claims submitted under Document 00 7200 (General Conditions), Article 12, are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release.

[Insert information in Chart below, affix attachment if necessary]

CLAIM NO.	DATE SUBMITTED	DESCRIPTION OF CLAIM	AMOUNT OF CLAIM

5. Consistent with California Public Contract Code §7100, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 2 of this Document 00 6530, Contractor hereby releases and forever discharges City, and all of its agents, employees, consultants, inspectors, assignees and transferees from any and all liability, claims, demands, actions or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.

6. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.

7. Contractor shall immediately defend, indemnify and hold harmless City, any of the City's Representatives, Project Manager, and all of their agents, employees, consultants, inspectors, assignees and transferees, from any and all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities that may be asserted against them by any of Contractor's suppliers and/or Subcontractors of any tier and/or any suppliers to them for any and all labor, materials, supplies and equipment used, or contemplated to be used in the performance of the Contract, except for the Disputed Claims set forth in Paragraph 4 of this Document 00 6530.

8. Contractor hereby waives the provisions of California Civil Code §1542, which provide as follows:

> **A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM OR HER, MUST HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR.**

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

10. Contractor represents and warrants that it is the true and lawful owner of all claims and other matters released pursuant to this Agreement and Release, and that it has full right, title and authority to enter into this instrument. Each party represents and warrants that it has been represented by counsel of its own choosing in connection with this Agreement and Release.

11. All rights of City shall survive completion of the Work or termination of the Contract, and execution of this Agreement and Release.

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

CITY

By: _____
Signature

Name: _____
Print

Its: _____
Title

ATTEST:

_____
Title

_____
Print

[CONTRACTOR]

By: _____
Signature

Name: _____
Print

Its: _____
Title

[CONTRACTOR]

By: _____
Signature

Name: _____
Print

Its: _____
Title

Pre-approved as to form:
CITY ATTORNEY
8/2016

END OF DOCUMENT

DOCUMENT 00 6536

GUARANTY

TO: The City of Berkeley ("City"), for construction of West Berkeley Service Center Improvement Project located at 1900 Sixth Street, Berkeley, CA 94710.

The undersigned guarantees all construction performed on this Project and also guarantees all material and equipment incorporated therein.

Contractor hereby grants to City for a period of one year following the date of Final Acceptance of the Work completed, or such longer period specified in the Contract Documents, its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers in connection with the Work.

Neither final payment nor use nor occupancy of the Work performed by the Contractor shall constitute an acceptance of Work not done in accordance with this Guaranty or relieve Contractor of liability in respect to any express warranties or responsibilities for faulty materials or workmanship. Contractor shall remedy any defects in the Work and pay for any damage resulting therefrom, which shall appear within one year, or longer if specified, from the date of Final Acceptance of the Work completed.

If within one year after the date of Final Acceptance of the Work completed, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be Defective, Contractor shall promptly, without cost to City and in accordance with City's written instructions, correct such Defective Work. Contractor shall remove any Defective Work rejected by City and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, City may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, City shall have all rights and remedies granted by law.

Inspection of the Work shall not relieve Contractor of any of its obligations under the Contract Documents. Even though equipment, materials, or Work required to be provided under the Contract Documents have been inspected, accepted, and estimated for payment, Contractor shall, at its own expense, replace or repair any such equipment, material, or Work found to be Defective or otherwise not to comply with the requirements of the Contract Documents up to the end of the guaranty period.

All abbreviations and definitions of terms used in this Agreement shall have the meanings set forth in the Contract Documents.

The foregoing Guaranty is in addition to any other warranties of Contractor contained in the Contract Documents, and not in lieu of, any and all other liability imposed on Contractor under the Contract Documents and at law with respect to Contractor's duties, obligations, and performance under the Contract Documents. In the event of any conflict or inconsistency between the terms of this Guaranty and any warranty or obligation of the Contractor under the Contract Documents or at law, such inconsistency or conflict shall be resolved in favor of the higher level of obligation of the Contractor.

Date: _____, 20___

_____
Contractor's name

By: _____
Signature

Print Name

Title

Street Address

City, State, Zip code

END OF DOCUMENT

DOCUMENT 00 6580

CITY OF BERKELEY CONTRACTING POLICIES

Contractor shall comply with the City of Berkeley's adopted employment policies applying to City construction projects as described in Document 00 7317. The following certifications/forms shall be submitted in accordance with Document 00 2113 Instructions to Bidders:

- Memorandum of Understanding
- Workforce Composition Form
- Agreement for Change in Subcontractors
- Nuclear Free Zone Disclosure Form
- Oppressive States Compliance Statement
- Sanctuary City Compliance Certification
- Hardwood Disclosure Form
- ~~First Source Construction Agreement (for projects between $100,000 and $500,000)~~ - Not applicable to this project.
- ~~Community Workforce Agreement, Agreement to be Bound (for projects over $500,000)~~ - Not applicable to this project.
- Right to Audit Form
- Certification Of Compliance With Equal Benefits Ordinance
- Taxpayer Identification Report
- Contractor's License
- City of Berkeley Business License

CITY OF BERKELEY
MEMORANDUM OF UNDERSTANDING
(MOU)

1. The Contractor (and all Subcontractors) agree not to discriminate pursuant to City Ordinance No. 5876.

2. The Contractor agrees that he/she is also responsible for his/her Subcontractors' compliance with City of Berkeley Ordinance No. 5876.

3. For contracts over $100,000, the Contractor agrees to comply with Ordinance No. 5876 as applied to the First Source Program (see Section 8 of Ordinance 5876).

The Contractor agrees to submit periodic employment and wage reports to the City's Contract Compliance Officer upon reasonable request.

Contractor	City of Berkeley Contracts Compliance Officer Or his/her designee
Date	Date

CITY OF BERKELEY
WORKFORCE COMPOSITION FORM FOR ALL CONSTRUCTION CONTRACTS

This form is to be completed and submitted prior to the Contract Compliance Conference. The Contractor and all Subcontractors who will do work valued at $3,000 or more are required to submit this form. Weekly payroll reports will be compared to this listing to monitor for compliance. A payroll printout or other listing of employees providing the same information will be accepted.

Name of Contractor/Subcontractor: _____

Project: _____

Name		Race*	Sex**	Trade/Craft	Basic Hourly Rate	Hire Date	Employees to be used on this job

* A=Asian or Pacific Islander
AI=American Indian
B=Afro American
C=Caucasian
H=Hispanic (Mexican, Puerto Rican, Spanish, Cuban, Chicano, Central or South American)
8/91

**M = Male
**F = Female

Signature: _____ Date: _____
Contractor/Subcontractor

Verified By: _____ Date: _____
City of Berkeley Contracts Compliance Officer or his/her designee

CITY OF BERKELEY
AGREEMENT FOR CHANGE IN SUB-CONTRACTORS

I agree to use the Subcontractor(s) listed in the signed contract with the City of Berkeley. If it should become necessary to change Subcontractors, I will notify the Capital Projects Manager by completing the following information:

Current Subcontractor(s)	Alternate Subcontractors	Reason for Change	Date

Signed by: Verified by:

Prime Contractor	Subcontractor	City of Berkeley Contracts Compliance Officer Or his/her designee
Date: _____	Date: _____	Date: _____

CITY OF BERKELEY

NUCLEAR FREE ZONE DISCLOSURE FORM

I (we) certify that:

1. I am (we are) fully cognizant of any and all contracts held, products made or otherwise handled by this business entity, and of any such that are anticipated to be entered into, produced or handled for the duration of its contract(s) with the City of Berkeley. (To this end, this disclosure form may be signed by more than one individual, if a description of which type of contracts each individual is cognizant is attached.)

2. I (we) understand that Section 12.90.070 of the Nuclear Free Berkeley Act (Berkeley Municipal Code Ch. 12.90; Ordinance No. 5784-N.S.) prohibits the City of Berkeley from contracting with any person or business that knowingly engages in work for nuclear weapons.

3. I (we) understand the meaning of the following terms as set forth in Berkeley Municipal Code section 12.90.130:

"Work for nuclear weapons" is any work the purpose of which is the development, testing, production, maintenance or storage of nuclear weapons or the components of nuclear weapons; or any secret or classified research or evaluation of nuclear weapons; or any operation, management or administration of such work.

"Nuclear weapon" is any device, the intended explosion of which results from the energy released by reactions involving atomic nuclei, either fission or fusion or both. This definition of nuclear weapons includes the means of transporting, guiding, propelling or triggering the weapon if and only if such means is destroyed or rendered useless in the normal propelling, triggering, or detonation of the weapon.

"Component of a nuclear weapon" is any device, radioactive or non-radioactive, the primary intended function of which is to contribute to the operation of a nuclear weapon (or be a part of a nuclear weapon).

4. Neither this business entity nor its parent nor any of its subsidiaries engages in work for nuclear weapons or anticipates entering into such work for the duration of its contract(s) with the City of Berkeley.

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

Signed: _____ Date: _____

Printed Name and Title(s): _____

Company: _____

CITY OF BERKELEY

Oppressive States Compliance Statement for Personal Services

The undersigned, an authorized agent of_____(hereafter "Vendor"), has had an opportunity to review the requirements of Berkeley City Council Resolution Nos. 59,853-N.S., 60,382-N.S., and 70,606-N.S., (hereafter "Resolutions"). Vendor understands and agrees that the City may choose with whom it will maintain business relations and may refrain from contracting with those Business Entities which maintain business relationships with morally repugnant regimes. Vendor understands the meaning of the following terms used in the Resolutions:

"Business Entity" means "any individual, firm, partnership, corporation, association or any other commercial organization, including parent-entities and wholly-owned subsidiaries" (to the extent that their operations are related to the purpose of the contract with the City).

"Oppressive State" means: **Tibet Autonomous Region, the provinces of Ado, Kham, and U-Tsang; and Burma (Myanmar)**

“Personal Services” means “the performance of any work or labor and shall also include acting as an independent contractor or providing any consulting advice or assistance, or otherwise acting as an agent pursuant to a contractual relationship.”

Contractor understands that it is not eligible to receive or retain a City contract if at the time the contract is executed, or at any time during the term of the contract it provides Personal Services to:

a. The governing regime in any Oppressive State.
b. Any business or corporation organized under the authority of the governing regime of any Oppressive State.
c. Any person for the express purpose of assisting in business operations or trading with any public or private entity located in any Oppressive State.

Vendor further understands and agrees that Vendor's failure to comply with the Resolution shall constitute a default of the contract and the City Manager may terminate the contract and bar Vendor from bidding on future contracts with the City for five (5) years from the effective date of the contract termination.

The undersigned is familiar with, or has made a reasonable effort to become familiar with, Vendor's business structure and the geographic extent of its operations. By executing the Statement, Vendor certifies that it complies with the requirements of the Resolution and that if any time during the term of the contract it ceases to comply, Vendor will promptly notify the City Manager in writing.

Based on the foregoing, the undersigned declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Printed Name: _____ Title:_____

Signature: _____ Date:_____

Business Entity: _____

I am unable to execute this Statement; however, Vendor is exempt under Section VII of the Resolution. I have attached a separate statement explaining the reason(s) Vendor cannot comply and the basis for any requested exemption.

Signature: _____ Date:_____

Contract Description/Specification No.:_____

ATTACHMENT D

Rev. 1/1/2023

CITY OF BERKELEY
Sanctuary City Compliance Statement

The undersigned, an authorized agent of _____(hereafter "Contractor"), has had an opportunity to review the requirements of Berkeley Code Chapter 13.105 (hereafter "Sanctuary City Contracting Ordinance" or "SCCO"). Contractor understands and agrees that the City may choose with whom it will maintain business relations and may refrain from contracting with any person or entity that provides Data Broker or Extreme Vetting services to the U.S. Immigration and Customs Enforcement Division of the United States Department of Homeland Security ("ICE"). Contractor understands the meaning of the following terms used in the SCCO:

a. "Data Broker" means either of the following:

   i. The collection of information, including personal information about consumers, from a wide variety of sources for the purposes of reselling such information to their customers, which include both private-sector business and government agencies;

   ii. The aggregation of data that was collected for another purpose from that for which it is ultimately used.

b. "Extreme Vetting" means data mining, threat modeling, predictive risk analysis, or other similar services." Extreme Vetting does not include:

   i. The City's computer-network health and performance tools;

   ii. Cybersecurity capabilities, technologies and systems used by the City of Berkeley Department of Information Technology to predict, monitor for, prevent, and protect technology infrastructure and systems owned and operated by the City of Berkeley from potential cybersecurity events and cyber-forensic based investigations and prosecutions of illegal computer based activity.

Contractor understands that it is not eligible to receive or retain a City contract if at the time the Contract is executed, or at any time during the term of the Contract, it provides Data Broker or Extreme Vetting services to ICE.

Contractor further understands and agrees that Contractor's failure to comply with the SCCO shall constitute a material default of the Contract and the City Manager may terminate the Contract and bar Contractor from bidding on future contracts with the City for five (5) years from the effective date of the contract termination.

By executing this Statement, Contractor certifies that it complies with the requirements of the SCCO and that if any time during the term of the Contract it ceases to comply, Contractor will promptly notify the City Manager in writing. Any person or entity who knowingly or willingly supplies false information in violation of the SCCO shall be guilty of a misdemeanor and up to a $1,000 fine.

Based on the foregoing, the undersigned declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this _____day of ____, 20__, at _____, California.

Printed Name: _____Title:_____

Signed: _____Date:_____

Business Entity: _____

SCCO CompStmt (Oct2019)

CITY OF BERKELEY

HARDWOOD DISCLOSURE FORM

For use by vendors on contracts utilizing lumber

1. I understand that on December 12, 1995, the City Council directed staff not to purchase lumber from companies that purchase or sell wood or paper products that come from tropical rainforests. I understand that wood species with tropical origins include, but are not limited to: Apitong, Banak, Bocote, Bubinga, Cocobolo, Cordia, Ebony, Goncalo alves, Greenheart, Iroko, Jelutang, Koa, Luauan, Mahogany, Meranti, Padauk, Purpleheart, Ramin, Rosewood, Satinwood, Teak, Virola, Wenge, and Zebrawood.

2. I am knowledgeable about the wood and paper products purchased and sold by this company.

3. This company does not currently purchase or sell wood or paper products having their origins in tropical rainforests. In addition, this company will not, for the duration of its contract with the City of Berkeley, purchase or sell wood or paper products having their origins in tropical rainforests.

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

Signed: _____ Date: _____

Printed Name & Title: _____

Company: _____

I am unable to sign this disclosure form for the following reason(s):

_____

_____

_____

_____

_____

FIRST SOURCE CONSTRUCTION AGREEMENT

EXHIBIT "A"

First Source Construction Agreement

I certify that:

I. I am authorized to enter into this agreement on behalf of the company whose name appears below ("Contractor").

II. Contractor understands and agrees to comply with the City of Berkeley First Source Construction Agreement.

III. I choose Method One: check here _____

A. Contractor understands that selecting Method One agreement with the City of Berkeley means that
Contractor agrees as follows:

1. To utilize the First Source Program Construction Employment Program as the first place for recruitment and referral of applicants for new and replacement workers.

2. To allow the First Source Program a minimum of seventy-two (72) hours to refer applicants to Contractors. (Contractor may apply to the City of Berkeley for a waiver of the seventy-two hour requirement for an emergency situation.)

3. To employ qualified applicants referred by the First Source Program.

4. To fully document the reason(s) for not hiring persons referred by the First Source Program.

5. To provide to the First Source Program, upon request, information on the employment status of First Source Program placements, and reason for separation if employee is terminated.

B. Should the First Source Program be unable to provide the employees needed, Contractor or subcontractor is relieved of its obligation to achieve the goals of the First Source Program.

1. No documentation of "good Faith Effort Steps" would be required of Contractor and subcontractors

2. No penalty would be assessed.

C. Contractor must go back to the First Source Program whenever its employment needs increase, to comply with the First Source Program.

D. Should Contractor or a listed subcontractor fail to comply with the First Source Program, Contractor shall be liable for liquidated damages in the amount of $1,000 or 1% of the contract amount for each day of non-compliance. In addition, Contractor or listed subcontractor may be deemed a non-responsible bidder in connection with future City of Berkeley contracts.

IV. I choose Method Two: check here _____

A. Should the contractor choose Method Two, Contractor can use any means of hiring Berkeley residents to achieve the goal. This also can include using union hiring halls requesting in writing for Berkeley residents. A copy must be sent to the First Source Program.

B. Should Contractor or subcontractor fail to achieve the goals at any time during the course of this project, Contractor or listed subcontractor will be required to document compliance with each of the "good Faith Effort Steps" listed in the First Source Program description document.

C. Should Contractor or a listed subcontractor fail to comply with the First Source Program, Contractor shall be liable for liquidated damages in the amount of $1,000 or 1% of the contract amount for each day of non-compliance. In addition, Contractor or listed subcontractor may be deemed a non-responsible bidder in connection with future City of Berkeley contracts.

Company Name	Owner/Authorized Representative Signature
Address	Printed Name of Owner / Authorized Representative
	Telephone Number

AGREEMENT TO BE BOUND

The undersigned, as a Contractor or Subcontractor ("Contractor") on a City Project ("Project"), for and in consideration of the award to it of a contract to perform work on said Project, and in further consideration of the mutual promises made in the Project's Community Workforce Agreement ("Agreement"), a copy which was received and is acknowledged, hereby:

1. Accepts and agrees to be bound by the terms and conditions of the Agreement, together with any and all amendments and supplements now existing or which are later made to said Agreement.

2. Certifies that it has no commitments or agreements which would preclude its full and complete compliance with the terms and conditions of said Agreement;

3. Agrees to secure from any Contractor (as defined in said Agreement) which is or becomes a subcontractor (or any tier) to it, and from any successors, a duly executed Agreement to be Bound in form identical to this document.

4. Contractor agrees that it shall be bound by all applicable trust agreements and plans for the provision of such fringe benefits as accrue to the direct benefit of the construction persons, including Health and Welfare, Pension, Training, Vacation, and/or other direct benefits provided pursuant to the appropriate craft agreement contained in Schedule "A" of Agreement.

Date: _____

Company Name: _____

Name of Prime Contractor or Higher Level Subcontractor:

_____

Name of Project: _____

Signature: _____

Print Name: _____

Title: _____

Mailing Address: _____

Email Address: _____

Contractor's License #: _____

Motor Carrier Permit (CA) #: _____

CITY OF BERKELEY
RIGHT TO AUDIT FORM

The Contractor agrees that pursuant to Section 61 of the Berkeley City Charter, the City Auditor's office may conduct an audit of Contractor's financial, performance and compliance records maintained in connection with the operations and services performed under this contract.

In the event of such audit, Contractor agrees to provide the Auditor with reasonable access to Contractor's employees and make all such financial, performance and compliance records available to the Auditor's office. City agrees to provide Contractor an opportunity to discuss and respond to any findings before a final audit report is filed.

Contractor's signature _____ Date: _____

Print Name and Title: _____

Company: _____

To be completed by Contractor/Vendor

Form EBO-1
CITY OF BERKELEY
CERTIFICATION OF COMPLIANCE WITH EQUAL BENEFITS ORDINANCE

If you are a ***contractor***, return this form to the originating department/project manager. If you are a ***vendor*** (supplier of goods), return this form to the Purchasing Division of the Finance Dept.

SECTION 1. CONTRACTOR/VENDOR INFORMATION

Name:			Vendor No.:
Address:	City:	State:	ZIP:
Contact Person:			Telephone:
E-mail Address:			Fax No.:

SECTION 2. COMPLIANCE QUESTIONS

A. The EBO is inapplicable to this contract because the contractor/vendor has no employees.
☐ Yes ☐ No *(If "Yes," proceed to Section 5; if "No", continue to the next question.)*

B. Does your company provide (or make available at the employees' expense) any employee benefits?
☐ Yes ☐ No
If "Yes," continue to Question C.
If "No," proceed to Section 5. (The EBO is not applicable to you.)

C. Does your company provide (or make available at the employees' expense) any benefits to the spouse of an employee? ..... ☐ Yes ☐ No

D. Does your company provide (or make available at the employees' expense) any benefits to the domestic partner of an employee? ..... ☐ Yes ☐ No
If you answered "No" to both Questions C and D, proceed to Section 5. (The EBO is not applicable to this contract.)
If you answered "Yes" to both Questions C and D, please continue to Question E.
If you answered "Yes" to Question C and **"No"** to Question D, please continue to Section 3.

E. Are the benefits that are available to the spouse of an employee identical to the benefits that are available to the domestic partner of the employee? ..... ☐ Yes ☐ No
If you answered "Yes," proceed to Section 4. (You are in compliance with the EBO.)
If you answered "No," continue to Section 3.

SECTION 3. PROVISIONAL COMPLIANCE

A. Contractor/vendor is not in compliance with the EBO now but will comply by the following date:

☐ By the first effective date after the first open enrollment process following the contract start date, not to exceed two years, if the Contractor submits evidence of taking reasonable measures to comply with the EBO; or

☐ At such time that administrative steps can be taken to incorporate nondiscrimination in benefits in the Contractor's infrastructure, not to exceed three months; or

☐ Upon expiration of the contractor's current collective bargaining agreement(s).

B. If you have taken all reasonable measures to comply with the EBO but are unable to do so, do you agree to provide employees with a cash equivalent?* ..... ☐ Yes ☐ No

* The cash equivalent is the amount of money your company pays for spousal benefits that are unavailable for domestic partners.

SECTION 4. REQUIRED DOCUMENTATION

At time of issuance of purchase order or contract award, you may be required by the City to provide documentation (copy of employee handbook, eligibility statement from your plans, insurance provider statements, etc.) to verify that you do not discriminate in the provision of benefits.

SECTION 5. CERTIFICATION

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that I am authorized to bind this entity contractually. By signing this certification, I further agree to comply with all additional obligations of the Equal Benefits Ordinance that are set forth in the Berkeley Municipal Code and in the terms of the contract or purchase order with the City.

Executed this _____day of _____, in the year _____, at _____ (City), _____ (State)

_____ Name (please print)

_____ Signature

_____ Title

_____ Federal ID or Social Security Number

FOR CITY OF BERKELEY USE ONLY

☐ Non-Compliant (The City may not do business with this contractor/vendor)

☐ One-Person Contractor/Vendor ☐ Full Compliance ☐ Reasonable Measures

☐ Provisional Compliance Category, Full Compliance by Date: _____

Staff Name(*Sign and Print*): _____ Date: _____ _____

TAXPAYER IDENTIFICATION REPORT

NAME/COMPANY'S NAME: _____

_____

MAILING ADDRESS: _____

_____

SOCIAL SECURITY NO.: _____

OR

EMPLOYER IDENTIFICATION NO.: _____

My Company is a Corporation [ ]

My Company is not a Corporation [ ]

I certify that the above information is true and correct:

_____ _____

(Signature) (Title)

The Tax Equity and Fiscal Responsibility Act of 1982 (Public Law 97-248) requires the above reporting information be furnished to the City.

Persons who do not furnish their tax information numbers become subject to backup withholding by the City at a rate of 20% from each disbursement made to the recipient.

END OF DOCUMENT

DOCUMENT 007200

GENERAL CONDITIONS

GENERAL CONDITIONS

ARTICLE 1 – INTERPRETATION OF CONTRACT DOCUMENTS

1.01 Interpretation Of Documents

A. Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. Individual Contract Documents subdivide at first level into Articles, and then into paragraphs.

1.02 Order Of Precedence Of Documents

A. In the case of discrepancy or ambiguity in the Contract Documents, the following order of precedence shall prevail:

1. Modifications in inverse chronological order (i.e., most recent first), and in the same order as specific portions they are modifying;
2. Agreement Forms (Document 00 5200), and terms and conditions referenced therein;
3. Supplementary General Conditions (Document 00 7201 et seq), if included;
4. General Conditions (Document 00 7200);
5. Division 1 Specifications, if included;
6. Drawings and Technical Specifications (Division 2 and above);
7. Written numbers over figures, unless obviously incorrect;
8. Figured dimensions over scaled dimensions;
9. Large-scale Drawings over small-scale Drawings.

B. Any conflict between Drawings and Technical Specifications (Division 2 and above) will be resolved in favor of the document of the latest date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.

C. Any conflict between a bill or list of materials shown in the Contract Documents and the actual quantities required to complete Work required by Contract Documents, will be resolved in favor of the actual quantities.

D. All Technical Specifications included in the Project manual shall be included within the Contract Documents unless identified otherwise.

ARTICLE 2 – PRE-BID INVESTIGATIONS

2.01 Pre-Bid Investigations Required

A. Prior to and as a condition of submitting a Bid and executing Document 00 5200 (Agreement), Contractor shall make reasonable efforts to investigate fully the Work of the Contract. Contractor shall visit the Site, examine thoroughly and understand fully the nature and extent of the Contract Documents, Work, Site, locality, actual conditions and as-built conditions.

B. Contractor's investigation shall include, without limitation, requesting and thoroughly examining of all reports of exploration and tests of subsurface conditions, as-built drawings, drawings, product specification(s) or reports, made available by City for contracting purposes or during Contractor's pre-bid investigations, of existing above ground and (to the extent applicable) below ground conditions (together, "Existing Conditions Data"), including, as applicable, Underground Facilities, geotechnical data, as-built data, utility surveys, record documents of all types, hazardous materials surveys, or similar materials which may appear or be referenced in the Project Manual or the in the Contract Documents, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto.

C. Contractor's investigations shall consider fully the fact that Existing Conditions Data is in many cases based on information furnished to City by others (e.g., the prior owner or builders), and that due to their age or their chain of custody since preparation, may not meet current industry standards for accuracy. Contractor shall also: (i.) provide City with prompt written notice of all

conflicts, errors, ambiguities, or discrepancies of any type, that it discovered in or among the Contract Documents and the Existing Conditions Data, and (ii.) subject to City's approval, conduct any such additional or supplementary examinations, investigations, explorations, tests, studies and data compilations, concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which Contractor may deem necessary in order to perform and furnish the Work in accordance with the terms and conditions of Contract Documents.

D. During performance of the Contract, Contractor will be charged with knowledge of all information that it should have learned in performing these pre-bid investigations and other obligations, and shall not be entitled to Change Orders (time or compensation) due to any information, error, inconsistency, omission, or conditions that Contractor should have known as a part of this Work. Contractor shall be responsible for the resultant losses, including, without limitation, the cost of correcting Defective Work.

2.02 Limited Reliance Permitted On City's Existing Conditions Data

A. Regarding aboveground and as-built conditions shown on the Contract Documents or supplied by City, such information has been compiled in good faith, however, City does not expressly or impliedly warrant or represent that such information is correctly shown or indicated, or otherwise complete for construction purposes. Contractor must independently verify such information as part of its pre-bid investigations, and where conditions are not reasonably verifiable or discrepancies are identified, bring such matters to City's attention through written question issued during the bid period. In executing Document 00 5200 (Agreement), Contractor shall rely on the results of its own independent investigation and shall not rely on City-supplied information regarding aboveground conditions and as-built conditions, and Contractor shall accept full responsibility for its verification work sufficient to complete the Work as intended.

B. Regarding subsurface conditions other than Underground Facilities shown on the Contract Documents or otherwise supplied by City, Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated in the Contract Documents. City is not responsible for the completeness of any subsurface condition information, Contractor's conclusions or opinions drawn from any subsurface condition information, or subsurface conditions that are not specifically shown. (For example, City is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown.)

2.03 Pre-Bid Investigation Requirements For Excavation And Utilities Relocation Projects

A. As part of its pre-bid investigations for Projects involving excavation and/or relocation of existing utilities, Contractor shall make reasonable efforts to verify information regarding Underground Facilities, including but not limited to, requesting additional information or verification of information as necessary.

B. Because of the nature and location of City and the Project, the existence of Underground Facilities is deemed inherent in the Work of the Contract, as is the fact that Underground Facilities are not always accurately shown or completely shown on as-built records, both as to their depth and location. Contractor shall, therefore, take care to note the existence and potential existence of Underground Facilities, in particular, above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, chemical, hot water, and other similar items and utilities. Contractor shall carefully consider all supplied information, request additional information Contractor may deem necessary, and visually inspect the Site for above ground indications of Underground Facilities (such as, for example not by way of limitation, the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site). Contractor shall also consider local underground conditions and typical practices for Underground Facilities, either through its own direct knowledge or through its subcontractors, and fully consider this knowledge in assessing the existing information and the reasonableness of its reliance.

ARTICLE 3 – SUBCONTRACTORS

3.01 Subcontractor Listing Law

A. Contractor shall comply with the Subcontractor Listing law, California Public Contract Code §§4101 et seq. Contractor shall not substitute any other person or firm in place of any Subcontractor listed in the Bid except as may be allowed by law.

B. Subcontractors shall not assign or transfer their subcontracts or permit them to be performed by any other contractor without City's written approval. At City's request, Contractor shall provide City with a complete copy of all executed subcontracts or final commercial agreements with Subcontractors and/or suppliers.

3.02 Subcontracts

A. Subcontract agreements shall preserve and protect the rights of City under the Contract Documents so that subcontracting will not prejudice such rights. To the extent of the Work to be performed by a Subcontractor, Contractor shall require the Subcontractor's written agreement (1) to be bound to the terms of Contract Documents and (2) to assume vis-à-vis Contractor all the obligations and responsibilities that Contractor assumes toward City under the Contract Documents. (These agreements include for example, and not by way of limitation, all warranties, claims procedures and rules governing submittals of all types to which Contractor is subject under the Contract Documents.)

B. Contractor shall provide for the assignment to City of all rights any Subcontractor (of any tier) may have against any manufacturer, supplier, or distributor for breach of warranties and guarantees relating to the Work performed by the Subcontractor under the Contract Documents. Subcontracts shall provide and acknowledge City as an intended third-party beneficiary of each subcontract and supply contract (of any tier).

ARTICLE 4 – DRAWINGS AND SPECIFICATIONS

4.01 Intent Of Drawings And Specifications

A. Contractor shall interpret words or phrases used to describe Work (including services), materials, or equipment that have well-known technical or construction industry or trade meaning in accordance with that meaning. Drawings' intent specifically includes the intent to depict construction that complies with all applicable laws, codes and standards.

B. As part of the "Work," Contractor shall provide all labor, materials, equipment, machinery, tools, facilities, services, employee training and testing, hoisting facilities, Shop Drawings, storage, testing, security, transportation, disposal, the securing of all necessary or required field dimensions, the cutting or patching of existing materials, notices, permits, documents, reports, agreements and any other items required or necessary to timely and fully complete Work described and the results intended by Contract Documents and, in particular, Drawings and Specifications. Divisions and Specification Sections and the identification on any Drawings shall not control Contractor in dividing Work among Subcontractors or suppliers or delineating the Work to be performed by any specific trade.

C. Contractor shall perform reasonably implied parts of Work as "incidental work" although absent from Drawings and Specifications. Incidental work includes any work not shown on Drawings or described in Specifications that is necessary or normally or customarily required as a part of the Work shown on Drawings or described in Specifications. Incidental work includes any work necessary or required to make each installation satisfactory, legally operable, functional, and consistent with the intent of Drawings and Specifications or the requirements of Contract Documents. Contractor shall perform incidental work without extra cost to City. Incidental work shall be treated as if fully described in Specifications and shown on Drawings, and the expense of incidental work shall be included in price Bid and Contract Sum.

4.02 Checking Of Drawings And Specifications

A. Before undertaking each part of Work, Contractor shall carefully study and compare Contract Documents and check and verify pertinent figures shown in the Contract Documents and all

applicable field measurements. Contractor shall be responsible for any errors that might have been avoided by such comparison. Figures shown on Drawings shall be followed; Contractor shall not scale measurements. Contractor shall promptly report to City, in writing, any conflict, error, ambiguity or discrepancy that Contractor may discover. Contractor shall obtain a written interpretation or clarification from City before proceeding with any Work affected thereby. Contractor shall provide City with a follow-up correspondence every ten calendar days until it receives a satisfactory interpretation or clarification.

4.03 Interpretation Of Drawings And Specifications

A. A typical or representative detail on Drawings shall constitute the standard for workmanship and material throughout corresponding parts of Work. Where necessary, and where reasonably inferable from Drawings, Contractor shall adapt such representative detail for application to such corresponding parts of Work. The details of such adaptation shall be subject to prior approval by City. Repetitive features shown in outline on Drawings shall be in exact accordance with corresponding features completely shown.

B. Should any discrepancy appear or any misunderstanding arise as to the import of anything contained in Drawings and Specifications, or should Contractor have any questions or requests relating to Drawings or Specifications, Contractor shall refer the matter to City, in writing, with a copy to the Architect/Engineer. City will issue with reasonable promptness written responses, clarifications or interpretations as City may determine necessary, which shall be consistent with the intent of and be reasonably inferable from Contract Documents. Such written clarifications or interpretations shall be binding upon Contractor. If Contractor believes that a written response, clarification or interpretation justifies an adjustment in the Contract Sum or Contract Time, Contractor shall give City prompt written notice. If the parties are unable to agree to the amount or extent of the adjustment, if any, then Contractor shall perform the Work in conformance with City's response, clarification, or interpretation and may make a written claim for the adjustment as provided in Article 12.

C. The following general specifications shall apply wherever in the Specifications, or in any directions given by City in accordance with or supplementing Specifications, it is provided that Contractor shall furnish materials or manufactured articles or shall do Work for which no detailed specifications are shown. Materials or manufactured articles shall be of the best grade, in quality and workmanship, obtainable in the market from firms of established good reputation. If not ordinarily carried in stock, the materials or manufactured articles shall conform to industry standards for first class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work shall conform to the usual standards or codes, such as those cited herein, for first class work of the kind required. Contractor shall specify in writing to City the materials to be used or Work to be performed under this Paragraph ten Business Days prior to furnishing such materials or performing such Work.

4.04 Use Of Drawings And Specifications.

A. Drawings, Specifications and other Contract Documents were prepared for use for Work of Contract Documents only. No part of Contract Documents shall be used for any other construction or for any other purpose except with the written consent of City. Any unauthorized use of Contract Documents is prohibited and at the sole liability of the user.

ARTICLE 5 – COMMENCEMENT OF THE WORK

5.01 Submission Of Required Schedules

A. Contractor shall submit to City in draft for review and discussion at the Preconstruction Conference, and in final prior to the first payment application, the following schedules:
   1. Schedule of Values
   2. Progress Schedule, and
   3. Schedule of Submittals.

B. No progress payment shall be due or owing to Contractor until such schedules are submitted to and acceptable to City and/or Architect/Engineer as meeting the requirements of the Contract

Documents. In City's sole discretion, City may elect to instead withhold a portion of any progress payment for unacceptable compliance with contract requirements for such schedules.

C. City's acceptance of Contractor's schedules will not create any duty of care or impose on City any responsibility for the sequencing, scheduling or progress of Work nor will it interfere with or relieve Contractor from Contractor's full responsibility therefore.

5.02 Commencement Date Of Contract Time

A. The Contract Time will commence to run on the 60th Day after the issuance of the Notice of Award or, if a Notice to Proceed is given, on the date indicated in the Notice to Proceed.

B. City may give a Notice to Proceed at any time within 60 calendar days after the Notice of Award. Contractor shall not do any Work at the Site prior to the date on which the Contract Time commences to run.

ARTICLE 6 – CONTRACTOR'S ORGANIZATION AND EQUIPMENT

6.01 Contractor's Legal Address

A. Address and facsimile number given in Contractor's Bid are hereby designated as Contractor's legal address and facsimile number. Contractor may change its legal address and facsimile number by notice in writing, delivered to City, which in conspicuous language advises City of a change in legal address or facsimile number, and which City accepts in writing. Delivery to Contractor's legal address or depositing in any post office or post office box regularly maintained by the United States Postal Service, in a wrapper with postage affixed, directed to Contractor at legal address, or of any drawings, notice, letter or other communication, shall be deemed legal and sufficient service thereof upon Contractor. Facsimile to Contractor's designated facsimile number of any letter, memorandum, or other communication on standard or legal sized paper, with proof of facsimile transmission, shall be deemed legal and sufficient service thereof upon Contractor.

6.02 Contractor's Superintendents Or Forepersons

A. Contractor shall at all times be represented on Site by one or more superintendents or forepersons authorized and competent to receive and carry out any instructions that City may give, and shall be liable for faithful observance of instructions delivered to Contractor or to authorized representative or representatives on Site.

6.03 Proficiency In English

A. Supervisors, security guards, safety personnel and employees who have unescorted access to the Site shall possess proficiency in the English language in order to understand, receive and carry out oral and written communications or instructions relating to their job functions, including safety and security requirements.

6.04 Contractor's And Subcontractors' Employees

A. Contractor shall employ, and shall permit its Subcontractors to employ, only competent and skillful personnel to do Work. If City notifies Contractor that any of its employees, or any of its Subcontractors' employees on Work is incompetent, unfaithful, disorderly or profane, or fails to observe customary standards of conduct or refuses to carry out any provision of the Contract Documents, or uses threatening or abusive language to any person on Work representing City, or violates sanitary rules, or is otherwise unsatisfactory, and if City requests that such person be discharged from Work, then Contractor or its Subcontractor shall immediately discharge such person from Work and the discharged person shall not be re-employed on the Work except with consent of City.

6.05 Contractor's Use Of The Site

A. Contractor shall not make any arrangements with any person to permit occupancy or use of any land, structure or building within the limits of the Work, for any purpose whatsoever, either with or without compensation, in conflict with any agreement between City and any owner, former owner

or tenant of such land, structure or buildings. Contractor may not occupy City-owned property outside the limit of the Work as indicated on the Drawings unless it obtains prior approval from City.

6.06 Contractor's Site Office

A. Unless expressly provided otherwise in the Contract Documents, Contractor shall provide a site office staffed by a resident project manager or job superintendent.

ARTICLE 7 – CITY'S ADMINISTRATION OF WORK

7.01 City's Representative(s)

A. City's Representative(s) will have limited authority to act on behalf of City as set forth in the Contract Documents.

B. Except as otherwise provided in these Contract Documents or subsequently identified in writing by City, City will issue all communications to Contractor through City's Representative, and Contractor shall issue all communications to City through City's Representative in a written document delivered to City.

C. Should any direct communications between Contractor and City's consultants, architects or engineers not identified in Article 2 of Document 00 5200 (Agreement) occur during field visits or by telephone, Contractor shall immediately confirm them in a written document copied to City.

7.02 City's Observation Of The Work

A. Work shall be performed under City's general observation and administration. Contractor shall comply with City's directions and instructions in accordance with the terms of Contract Documents, but nothing contained in these General Conditions shall be taken to relieve Contractor of any obligations or liabilities under the Contract Documents. City's failure to review or, upon review, failure to object to any aspect of Work reviewed, shall not be deemed a waiver or approval of any non-conforming aspect of Work.

B. Subject to those rights specifically reserved in the Contract Documents, City will not supervise, or direct, or have control over, or be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or Contractor's failure to comply with laws and regulations applicable to the furnishing or performance of Work. City will not be responsible for Contractor's failure to perform or furnish the Work in accordance with Contract Documents.

7.03 Architect/Engineer's Observation Of Work

A. City may engage an Architect/Engineer, an independent consultant or Project Manager (collectively for purposes of this Paragraph, "Project Manager/Architect") to assist in administering the Work. If so engaged, Project Manager/Architect will advise and consult with City, but will have authority to act on behalf of City only to extent provided in the Contract Documents or as set forth in writing by City. Project Manager/Architect will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with Work. Project Manager/Architect will not be responsible for or have control over the acts or omissions of Contractor, Subcontractors or their agents or employees, or any other persons performing Work.

B. Project Manager/Architect may review Contractor's Submittals, such as Shop Drawings, Product Data, and Samples, but only for conformance with design concept of Work and with information given in the Contract Documents.

C. Project Manager/Architect may visit the Site at intervals appropriate to stage of construction to become familiar generally with the progress and quality of Work and to determine in general if Work is proceeding in accordance with Contract Documents. Based on its observations, Project Manager/Architect may recommend to City that it disapproves or rejects Work that Project Manager/Architect believes to be Defective or will not produce a complete Project that conforms to Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by Contract Documents. City will also have authority

to require special inspection or testing of Work, whether or not the Work is fabricated, installed or completed.

D. Project Manager/Architect may conduct inspections to recommend to City the dates that Contractor has achieved Substantial Completion and Final Acceptance, and will receive and forward to City for review written warranties and related documents required by Contract Documents.

7.04 Owner's And Architect/Engineer's Exercise Of Contract Responsibilities

A. City, Project Manager, Architect/Engineer and all City's representatives, in performing their duties and responsibilities under the Contract Documents, accept no duties, responsibilities or duty of care, nor may the same be implied or inferred, towards Contractor, any Subcontractor, sub-Subcontractor or supplier, except those set forth expressly in the Contract Documents.

7.05 City's Right Of Access To The Work

A. During performance of Work, City and its agents, consultants, and employees may at any time enter upon Work, shops or studios where any part of the Work may be in preparation, or factories where any materials for use in Work are being or are to be manufactured, and Contractor shall provide proper and safe facilities for this purpose, and shall make arrangements with manufacturers to facilitate inspection of their processes and products to such extent as City's interests may require. Other contractors performing work for City may also enter upon Work for all purposes required by their respective contracts. Subject to the rights reserved in the Contract Documents, Contractor shall have sole care, custody, and control of the Site and its Work areas.

7.06 City's Right Of Separate Construction

A. City may perform with its own forces, construction or operations related to the Project, or the Site during Contractor's operations. City may also award separate contracts in connection with other portions of the Project or other construction or operations, on the Site or areas contiguous to the Site, under conditions similar to these Contract Documents, or may have utility owners perform other work.

B. Contractor shall adjust its schedule and fully coordinate with and shall afford all other contractors, utility districts and City (if City is performing work with its own forces), proper and safe access to the Site, and reasonable opportunity for the installation and storage of their materials. Contractor shall ensure that the execution of its Work properly connects and coordinates with others' work, do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work, and shall cooperate with them to facilitate the progress of the Work.

C. To the extent that any part of Contractor's Work is to interface with work performed or installed by other contractors or utility owners, Contractor shall inspect and measure the in-place work. Contractor shall promptly report to City in writing any defect in in-place work that will impede or increase the cost of Contractor's interface unless corrected.

ARTICLE 8 – CONTRACTOR'S PROSECUTION AND PROGRESS OF THE WORK

8.01 Contractor To Supervise The Work

A. Subject to those rights specifically reserved in the Contract Documents, Contractor shall supervise, direct, have control over, and be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, safety precautions and programs incident thereto, and compliance with laws and regulations applicable to the furnishing or performance of Work.

B. Contractor shall keep on the Site at all times during Work progress a competent resident Superintendent, who shall not be replaced without City's express written consent. The Superintendent shall be Contractor's representative at the Site and shall have complete authority to act on behalf of Contractor. All communications to and from the Superintendent shall be as binding as if given to or by Contractor.

C. Contractor shall supervise, inspect, and direct Work competently and efficiently, devoting the

attention and applying such personal skills and expertise as may be required and necessary to perform Work in accordance with Contract Documents. Contractor shall be solely responsible for and have control and charge of construction means, methods, techniques, sequences and procedures, safety precautions and programs in connection with the Work. Contractor shall be responsible to see that the completed Work complies accurately with Contract Documents.

D. Contractor is fully responsible for Contractor's own acts and omissions. Contractor is responsible for all acts and omissions of its Subcontractors, suppliers, and other persons and organizations performing or furnishing any of the Work, labor, materials, or equipment under a direct or indirect contract with Contractor.

E. Contractor shall conduct monthly Contractor Safety Committee meetings, and weekly toolbox safety talks.

8.02 Contractor To Maintain Cost Data

A. Contractor shall maintain full and correct information as to the number of workers employed in connection with each subdivision of Work, the classification and rate of pay of each worker in form of certified payrolls, the cost to Contractor of each class of materials, tools and appliances used by Contractor in Work, and the amount of each class of materials used in each subdivision of Work. Contractor shall provide City with monthly summaries of this information. If Contractor maintains or is capable of generating summaries or reports comparing actual Project costs with Bid estimates or budgets, Contractor shall provide City with a copy of such report upon City's request.

B. Contractor shall maintain daily job reports recording all significant activity on the job, including the number of workers on Site, Work activities, problems encountered and delays. Contractor shall provide City with copies for each Day Contractor works on the Project, to be delivered to City either the same Day or the following morning before starting work at the Site. Contractor shall take pre-construction and monthly progress photographs of all areas of the Work. Contractor shall maintain copies of all correspondence with Subcontractors and records of meetings with Subcontractors.

C. City shall have the right to audit and copy Contractor's books and records of any type, nature or description relating to the Project (including but not limited to financial records reflecting in any way costs claimed on the Project), and to inspect the Site, including Contractor's trailer, or other job Site office, and this requirement shall be contained in the subcontracts of Subcontractors working on Site. By way of example, City shall have the right to inspect and obtain copies of all Contract Documents, planning and design documents, Bid proposal and negotiation documents, cost records and job cost variance reports, design modification proposals, value engineering or other cost reduction proposals, revisions made to the original design, job progress reports, photographs, and as-built drawings maintained by Contractor. City and any other applicable governmental entity shall have the right to inspect all information and documents maintained hereunder at any time during the Project and for a period of five years following Final Completion, in accordance with the provisions of Section 8546.7 of the California Government Code. This right of inspection shall not relieve Contractor of its duties and obligations under the Contract Documents. This right of inspection shall be specifically enforceable in a court of law, either independently or in conjunction with enforcement of any other rights in the Contract Documents.

8.03 Contractor To Supply Sufficient Workers And Materials

A. Unless otherwise required by City under the terms of Contract Documents, Contractor shall at all times keep on the Site materials and employ qualified workers sufficient to prosecute Work at a rate and in a sequence and manner necessary to complete Work within the Contract Time. This obligation shall remain in full force and effect notwithstanding disputes or claims of any type.

B. At any time during progress of Work should Contractor directly or indirectly (through Subcontractors) refuse, neglect, or be unable to supply sufficient materials or employ qualified workers to prosecute the Work as required, then City may require Contractor to accelerate the Work and/or furnish additional qualified workers or materials as City may consider necessary, at no cost to City. If Contractor does not comply with the notice within three Business Days of date of service thereof, City shall have the right (but not a duty) to provide materials and qualified

workers to finish the Work or any affected portion of Work, as City may elect. City may, at its discretion, exclude Contractor from the Site, or portions of the Site or separate work elements during the time period that City exercises this right. City will deduct from moneys due or which may thereafter become due under the Contract Documents, the sums necessary to meet expenses thereby incurred and paid to persons supplying materials and doing Work. City will deduct from funds or appropriations set aside for purposes of Contract Documents the amount of such payments and charge them to Contractor as if paid to Contractor. Contractor shall remain liable for resulting delay, including liquidated damages and indemnification of City from claims of others.

C. Exercise by City of the rights conferred upon City in this subparagraph is entirely discretionary on the part of City. City shall have no duty or obligation to exercise the rights referred to in this subparagraph and its failure to exercise such rights shall not be deemed an approval of existing Work progress or a waiver or limitation of City's right to exercise such rights in other concurrent or future similar circumstances. (The rights conferred upon City under this subparagraph are, like all other such rights, cumulative to City's other rights under any provision of the Contract Documents.)

8.04 Contractor To Maintain Project Record Documents

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Contract Modifications, Change Orders, Work Directives, Force Account orders, and written interpretations and clarifications in good order and annotated to show all as-built changes made during construction. These Project Record Documents, together with all approved Samples and a counterpart of all approved Shop Drawings, shall be maintained and available to City for reference. Upon completion of the Work, Contractor shall deliver to City, the Project Record Documents, Samples and Shop Drawings and as-built drawings.

B. Throughout Contractor's performance of the Work of the Project, Contractor shall maintain construction records to include: shop drawings; product data/material data sheets; samples; submittal; purchases; materials; equipment; inspections; applicable handbooks; applicable codes and standards; maintenance and operating manuals and instructions; RFI Log; Submittal Log; other related documents and revisions which arise out of the Construction Contracts. Contractor shall maintain records of principal building layout lines, elevations for the bottom of footings, floor levels, and key site elevations (certified by a qualified surveyor or professional engineer). Contractor shall make all records available to City. At the completion of the Project, Contractor shall deliver all such records to the City to have a complete set of record as-built drawings.

8.05 Contractor To Not Disrupt City Operation

A. Contractor shall schedule and execute all Work in a manner that does not interfere with or disrupt City operations, including but not limited to, parking, utilities (electricity, gas, water), noise, access by employees and administration, access by vendors, physicians, patients and any other person or entity using City facilities or doing business with City. Contractor shall produce and supply coordination plans and requests to City, following City procedures, for all necessary interference of construction with City, which City will reasonably cooperate with.

8.06 Contractor To Provide Temporary Facilities And Controls

A. Unless expressly provided otherwise in the Contract Documents, Contractor shall provide all temporary utilities (including without limitation electricity, water, natural gas), lighting, heating, cooling and ventilating devices, telephone, sanitary facilities, barriers, fences and enclosures, tree and plant protection, fire protection, pollution, erosion, Storm Water Pollution Prevention controls, noise and traffic control, and any other necessary services required for construction, testing or completion of the Work.

ARTICLE 9 – WARRANTY, GUARANTY, AND INSPECTION OF WORK

9.01 Warranty And Guaranty

A. General Representations and Warranties: Contractor represents and warrants that it is and will

be at all times fully qualified and capable of performing every Phase of the Work and to complete Work in accordance with the terms of Contract Documents. Contractor warrants that all construction services shall be performed in accordance with generally accepted professional standards of good and sound construction practices and all requirements of Contract Documents. Contractor warrants that Work, including but not limited to each item of materials and equipment incorporated therein, shall be new, of suitable grade of its respective kind for its intended use, and free from defects in design, engineering, materials, construction and workmanship. Contractor warrants that Work shall conform in all respects with all applicable requirements of federal, state and local laws, applicable construction codes and standards, licenses, and permits, Drawings and Specifications and all descriptions set forth therein, and all other requirements of Contract Documents. Contractor shall not be responsible, however, for the negligence of others in the specification of specific equipment, materials, design parameters and means or methods of construction where that is specifically shown and expressly required by Contract Documents.

B. Extended Guarantees: Any guarantee exceeding one year provided by the supplier or manufacturer of any equipment or materials used in the Project shall be extended for such term. Contractor expressly agrees to act as co-guarantor of such equipment and materials and shall supply City with all warranty and guarantee documents relative to equipment and materials incorporated in the Project and guaranteed by their suppliers or manufacturers.

C. Environmental and Toxics Warranty: The covenants, warranties and representations contained in this Paragraph are effective continuously during Contractor's Work on the Project and following cessation of labor for any reason including, but not limited to, Project completion. Contractor covenants, warrants and represents to City that:

1. To Contractor's knowledge after due inquiry, no lead or Asbestos-containing materials were installed or discovered in the Project at any time during Contractor's construction thereof. If any lead or Asbestos-containing materials were discovered, Contractor made immediate written disclosure to City.
2. To Contractor's knowledge after due inquiry, no electrical transformers, light fixtures with ballasts or other equipment containing PCBs are or were located on the Project at any time during Contractor's construction thereof.
3. To Contractor's knowledge after due inquiry, no storage tanks for gasoline or any other toxic substance are or were located on the Project at any time during Contractor's construction thereof. If any such materials were discovered, Contractor made immediate written disclosure to City.
4. Contractor's operations concerning the Project are and were not in violation of any applicable environmental federal, state, or local statute, law or regulation dealing with hazardous materials substances or toxic substances and no notice from any governmental body has been served upon Contractor claiming any violation of any such law, ordinance, code or regulation, or requiring or calling attention to the need for any Work, repairs, construction, alteration, or installation on or in connection with the Project in order to comply with any such laws, ordinances, codes, or regulations, with which Contractor has not complied. If there are any such notices with which Contractor has complied, Contractor shall provide City with copies thereof.

9.02 Inspection Of Work

A. Work and materials, and manufacture and preparation of materials, from beginning of construction until Final Completion and acceptance of Work, shall be subject to inspection and rejection by City, its agents, representatives or independent contractors retained by City to perform inspection services, or governmental agencies with jurisdictional interests. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and program so that they may comply therewith as applicable. Upon request or where specified, City shall be afforded access for inspection at the source of supply, manufacture or assembly of any item of material or equipment, with reasonable accommodations supplied for making such inspections.

B. Contractor shall furnish, in such quantities and sizes as may be required for proper examination and tests, Samples or test specimens of all materials to be used or offered for use in connection

with Work. Contractor shall prepare Samples or test specimens at its expense and furnish them to City. Contractor shall submit all Samples in ample time to enable City to make any necessary tests, examinations, or analyses before the time it is desired to incorporate the material into the Work.

C. Contractor shall give City timely notice of readiness of Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

D. If applicable laws or regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, and furnish City with the required certificates of inspection, or approval. City will pay the cost of initial testing and Contractor shall pay all costs in connection with any follow-up or additional testing. Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for the acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

E. If Contractor covers any Work, or the work of others, prior to any required inspection, test or approval without written approval of City, Contractor shall uncover the Work at City's request. Contractor shall bear the expense of uncovering Work and replacing Work. In any case where Contractor covers Work contrary to City's request, Contractor shall uncover Work for City's observation or inspection at City's request. Contractor shall bear the cost of uncovering Work.

F. Whenever required by City, Contractor shall furnish tools, labor and materials necessary to make examination of Work that may be completed or in progress, even to extent of uncovering or taking down portions of finished Work. Should Work be found unsatisfactory, cost of making examination and of reconstruction shall be borne by Contractor. If Work is found to be satisfactory, City, in manner herein prescribed for paying for alterations, Modifications, and extra Work, except as otherwise herein specified, will pay for examination.

G. Inspection of the Work by or on behalf of City, or City's failure to do so, shall not under any circumstances be deemed a waiver or approval of any non-conforming aspect of the Work. Contractor shall have an absolute duty, in the absence of a written Change Order signed by City, to perform Work in conformance with the Contract Documents and to immediately correct Defective Work immediately upon Contractor's knowledge.

H. Any inspection, evaluation, or test performed by or on behalf of City relating to the Work is solely for the benefit of City, and shall not be relied upon by Contractor. Contractor shall not be relieved of the obligation to perform Work in accordance with the Contract Documents, nor relieved of any guaranty, warranty, or other obligation, as a result of any inspections, evaluations, or tests performed by City, whether or not such inspections, evaluations, or tests are permitted or required under the Contract Documents. Contractor shall be solely responsible for testing and inspecting Work already performed to determine whether such Work is in proper condition to receive later Work.

9.03 Correction Of Defective Work

A. City may direct Contractor to correct any Defective Work or remove it from the Site and replace it with Work that is not Defective and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting from the correction or removal. Contractor shall be responsible for any and all claims, costs, losses and damages caused by or resulting from such correction or removal. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, City may decide the proper amount or, in its discretion may elect to leave the Contract Sum unchanged and deduct from monies due Contractor, all such claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with City's calculations, it may make a claim as provided in Article 12 of this Document 00 7200. City's rights under this Paragraph shall be in addition to any other rights it may have under the Contract Documents or by law.

B. If Contractor fails to supply sufficient skilled workers, suitable materials or equipment, or to furnish or perform the Work in such a way that the completed Work will conform to Contract Documents, City may order Contractor to replace any such Defective Work, or stop any portion of Work to permit City (at Contractor's expense) to replace such Defective Work. These City rights are entirely discretionary on the part of City, and shall not give rise to any duty on the part of City to exercise the rights for the benefit of Contractor or any other party.

9.04 Acceptance And Correction Of Defective Work By City

A. City may in its sole discretion elect to accept Defective Work. Contractor shall pay all claims, costs, losses and damages attributable to City's evaluation of and determination to accept such Defective Work. If City accepts any Defective Work prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, City may deduct from monies due Contractor, all claims, costs, losses, damages, expenses and liabilities attributable to the Defective Work. If Contractor disagrees with City's calculations, Contractor may make a claim as provided in Article 12 of this Document 00 7200. If City accepts any Defective Work after final payment, Contractor shall pay to City, an appropriate amount as determined by City.

B. City may correct and remedy deficiency if, after five calendar days' written notice to Contractor, Contractor fails to correct Defective Work or to remove and replace rejected Work; or provide a plan for correction of Defective Work acceptable to City; or perform Work in accordance with Contract Documents. In connection with such corrective and remedial action, City may exclude Contractor from all or part of the Site; take possession of all or part of Work and suspend Contractor's Work related thereto; take possession of all or part of Contractor's tools, appliances, construction equipment and machinery at the Site; and incorporate in Work any materials and equipment stored at the Site or for which City has paid Contractor but which are stored elsewhere. Contractor shall allow City, its representatives, agents, employees, and other contractors and Project Manager/Architect's consultants' access to the Site to enable City to exercise the rights and remedies under this Paragraph. Contractor shall be responsible for all claims, costs, losses, damages, expenses and liabilities incurred or sustained by City in exercising such rights and remedies. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, City may deduct from moneys due Contractor, all claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with City's calculations, Contractor may make a claim as provided in Article 12.

9.05 Rights Upon Inspection, Correction Or Acceptance

A. Contractor shall not be allowed an extension of Contract Time because of any delay in the performance of Work attributable to the exercise by City of its rights and remedies under this Article. Where City exercises its rights under this Article, it retains and may still exercise all other rights it has by law or under the Contract Documents including, but not limited to, the right to terminate Contractor's right to proceed with the Work under the Contract Documents for cause and/or make a claim or back charge where a Change Order cannot be agreed upon.

B. Inspection by City or its authorized agents or representatives shall not relieve Contractor of its obligation to have furnished material and workmanship in accordance with Contract Documents. Payment for Work completed through periodic progress payments, final payment or otherwise shall not operate to waive City's right to require full compliance with Contract Documents and shall in no way be deemed as acceptance of any defective Work paid therefor. Contractor's obligation to complete the Work in accordance with Contract Documents shall be absolute, unless City agrees otherwise in writing.

9.06 Proof Of Compliance Of Contract Provisions

A. In order that City may determine whether Contractor has complied or is complying with requirements of Contract Documents not readily enforceable through inspection and tests of

Work and materials, Contractor shall at any time, when requested, submit to City properly authenticated documents or other satisfactory proofs of compliance with all applicable requirements.

B. Before commencing any portion of Work, Contractor shall inform City in writing as to time and place at which Contractor wishes to commence Work, and nature of Work to be done, in order that proper provision for inspection of Work may occur, and to assure measurements necessary for record and payment. Information shall be given to City a reasonable time in advance of time at which Contractor proposes to begin Work, so that City may complete necessary preliminary work without inconvenience or delay to Contractor.

9.07 Correction Period And Project Warranty Period:

A. If within one year after the date of Final Acceptance, or such longer period of time as may be prescribed by laws, regulations or by the terms of Contract Documents or any extended warranty or guaranty, any Work (completed or incomplete) is found to be Defective, Contractor shall promptly without cost to City and in accordance with City's written instructions, correct such Defective Work. Contractor shall remove any Defective Work rejected by City and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, City may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, City shall have all rights and remedies granted by law.

B. In special circumstances where a part of the Work is occupied or a particular item of equipment is placed in continuous service before Final Acceptance of all the Work, the correction period for that part of Work or that item may start to run from an earlier date if so provided by Change Order.

C. Where Defective Work or rejected Work (and damage to other Work resulting therefrom) has been corrected, removed, or replaced under this provision after the commencement of the correction period, the correction period hereunder with respect to such Work shall be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

9.08 No Waiver

A. Neither recordation of Final Acceptance nor final certificate for payment nor provision of the Contract nor partial or entire use or occupancy of premises by City shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.

B. If, after installation, operation, or use of materials or equipment to be provided under Contract proves to be unsatisfactory to City, City shall have right to operate and use materials or equipment until said materials and equipment can, without damage to City, be taken out of service for correction or replacement. Period of use of Defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.

C. Nothing in the Contract Documents shall be construed to limit, relieve, or release Contractor's, Subcontractors', and equipment suppliers' liability to City for damages sustained as result of latent defects in materials or equipment caused by negligence of Contractor, its agents, suppliers, employees, or Subcontractors.

ARTICLE 10 – MODIFICATIONS OF CONTRACT DOCUMENTS

10.01 City's Right To Direct Changed Work.

A. City may, without notice to the sureties and without invalidating the Contract, make changes in the Work ("Changed Work"), including without limitation: alterations, deviations, additions to, or

deletions from Contract Documents; increase or decrease the quantity of any item or portion of the Work; expand, reduce or otherwise change the Contract Time; delete any item or portion of the Work; and require extra Work. Contractor shall perform such Work under applicable provisions of the Contract Documents, unless specifically provided otherwise at the time the change is ordered. In the case of any ordered extra Work, City reserves the right to furnish all or portions of associated labor, material, and equipment, which Contractor shall accept and use without payment for costs, markup, profit, or otherwise for such City-furnished labor, materials, and equipment.

B. If Changed Work is of such a nature as to increase or decrease the time or cost of any part of Work, price fixed in Contract shall be increased or decreased by amount as the Contractor and City may agree upon as reasonable and proper allowance for increase or decrease in cost of Work using the cost guidelines set forth in this Article, and absent such agreement, then as City may direct (with Contractor retaining its rights under Article 12 herein).

10.02 Required Documentation For Changed Work

A. Changes affecting the Contract Time or Contract Sum of the Work shall be set forth in a written Change Order or Change Directive that shall specify:
   1. The Work performed in connection with the change to be made;
   2. The amount of the adjustment of the Contract Sum, if any, and the basis for compensation for the Work ordered; and
   3. The extent of the adjustment in the Contract Time, if any.

B. A Change Order or Change Directive will become effective when signed by City, notwithstanding that Contractor has not signed it. A Change Order will become effective without Contractor's signature, provided City indicates same thereon (by indicating it as a "unilateral change order").

C. All changes in any plans and specifications approved by any authority with jurisdiction may also require addenda or change orders approved by that authority.

D. Where City requests, a performance bond rider covering the changed Work must be executed and delivered to City before proceeding with the changed Work or shortly in time thereafter.

10.03 Procedures And Pricing Of Changed Work

A. Procedures for changed work and pricing of changed work, claims and all forms of extra compensation, are set forth in Section 01 2600 (Modification Procedures).

ARTICLE 11 – TIME ALLOWANCES

11.01 Time Allowances

A. Time is of the essence. Contract Time may only be changed by Change Order, and all time limits stated in the Contract Documents are to mean that time is of the essence.

11.02 Excusable Delay And Inexcusable Delay Defined.

A. Excusable Delay. Subject to the provisions on Notice of Delay below, Contract Time may be adjusted in an amount equal to the time lost due to:
   1. Changes in the Work ordered by City ("**Changes**");
   2. Acts or neglect by City, Architect, any City Representative, utility owners or other contractors performing other work, not permitted or provided for in the Contract Documents, provided that Contractor has performed its responsibilities under the Contract Documents (including but not limited to pre-bid investigations) ("**Acts or Neglect**"); or
   3. Fires, floods, epidemics, abnormal weather conditions beyond the parameters otherwise set forth in this Article, earthquakes, civil or labor disturbances, or acts of God (together, "force majeure events"), provided damages resulting therefrom are not the result of Contractor's failure to protect the Work as required by Contract Documents ("**Force Majeure**").

B. Inexcusable Delay. Contract Time shall not be extended for any period of time where Contractor (and/or any Subcontractor) is delayed or prevented from completing any part of the Work due to a

cause that is within Contractor's risk or responsibility under the Contract Documents. Delays attributable to or within the control of a Subcontractor, or its subcontractors, or supplier, are deemed delays within the control of Contractor.

C. Float. Float shall be treated as a Project resource. Contractor shall not be entitled to a time extension for impacts that consume float, but do not impact the critical path.

11.03 Notice Of Delay

A. Within seven calendar days of the beginning of any delay (excepting adverse weather delays), Contractor shall notify City in writing, by submitting a notice of delay that shall describe the anticipated delays resulting from the delay event in question. If Contractor requests an extension of time, Contractor shall submit a Time Impact Evaluation (TIE) within ten calendar days of the notice of delay. City will determine all claims and adjustments in the Contract Time. No claim for an adjustment in the Contract Time will be valid and such claim will be waived if not submitted in accordance with the requirements of this subparagraph. In cases of substantial compliance with the seven-day notice requirement here (but not to exceed twenty-one calendar days from the beginning of the delay event), City may in its sole discretion recognize a claim for delay accompanied with the proper TIE, provided Contractor also shows good faith and a manifest lack of prejudice to City from the late notice.

11.04 Compensable Time Extensions

A. Subject to other applicable provisions of the Contract Documents, Contractor may be entitled to adjustment in Contract Sum in addition to Contract Time for:

1. Excusable delay caused solely by Changes in the Work ordered by City, as provided above, and/or
2. Excusable delay caused solely by Acts or Neglect by City or other person, as provided above.

11.05 Non-Compensable Time Extensions

A. Subject to other applicable provisions of the Contract Documents, Contractor may be entitled to adjustment in Contract Time only, without adjustment in Contract Sum, for

1. Periods of excusable delay caused solely by weather or Force Majeure events as provided above in this Article, or
2. Periods of concurrent delay, where delay results from two or more causes, one of which is compensable (resulting from Changes or Acts or Neglect as set forth above in this Article), and the other of which is non-compensable or unexcusable, such as: acts or neglect of Contractor, Subcontractors or others for whom Contractor is responsible; other acts, omissions and conditions which would not entitle Contractor to adjustment in Contract Time; adverse weather; and/or actions of Force Majeure as provided above in this Article.

11.06 Adverse Weather

A. Adverse weather delays may be allowed only if the number of workdays of adverse weather exceeds the parameters listed or referenced immediately below in this subparagraph and Contractor proves that adverse weather actually caused delays to work on the critical path. Contractor shall give written notice of intent to claim an adverse weather day within one Day of the adverse weather day occurring.

B. Claims for extension of time for rain delay will not be granted unless the number of calendar days work is prevented by rain exceeds 110% of the average number of rain days expected for the period of the Contract Time, based on the records of the National Oceanic & Atmospheric Administration (NOAA) weather station closest to the Project Site, as measured and reported by NOAA. (For example, for California, Oregon and Washington, these figures are contained in the ">=0.10 inch" column at the applicable weather station's "General Climate Summary Table" for "Precipitation" at http://www.wrcc.dri.edu/Climsum.html), pro-rated in the individual month Contractor starts and finishes Work. Delays due to adverse weather conditions will not be allowed for weather conditions that fall within these parameters.

C. In order to qualify as an adverse weather delay with respect to the foregoing parameters, (i.) daily rainfall must exceed .1 inch, and/or (ii.) daily snowfall must exceed 1.0 inch or more, at the NOAA station located closest to the Project site, as measured and reported by NOAA. Notwithstanding these allowances, Contractor shall at all times employ all available mitigation measures to enable Work to continue, Contractor shall take reasonable steps to mitigate potential weather delays, such as dewatering the Site, lime treatment, and covering Work and material that could be affected adversely by weather. Failure to do so shall be cause for City to not grant a time extension due to adverse weather, where Contractor could have avoided or mitigated the potential delay by exercising reasonable care.

D. Contractor shall include the foregoing precipitation parameters as a monthly activity in its progress schedule. As Work on the critical path is affected by precipitation, Contractor shall notify City and request that the days be moved to the affected activities. Any adverse weather days remaining shall be considered Project float available to either City or Contractor.

E. Adverse weather delay for precipitation shall be recognized for the actual period of time Contractor proves it was delayed by precipitation exceeding the specified parameters. For example, and not by way of limitation, if precipitation exceeding the specified parameters does not in fact delay Contractor's progress on the critical path, then no time extension shall be recognized; and conversely, if Contractor proves to City's satisfaction that precipitation exceeding the specified parameters causes delay to Contractor for a period longer than the number of precipitation days incurred (e.g., if it rains or snows during grading work), then Contractor shall be entitled to a time extension equal to the actual period of such delay.

F. During unfavorable weather, wet ground, or other unsuitable construction conditions, Contractor shall employ best practices to protect the Work, manage the construction site and rainwater during inclement weather. Persons performing the Work shall examine surfaces to receive their Work and shall report in writing to Contractor, with copy to City representative and the Architect conditions detrimental to the Work. Failure to examine and report discrepancies makes the Contractor responsible, at no increase in Contract Sum, for corrections City may require. Commencement of Work constitutes acceptance of surface.

11.07 Liquidated Damages

A. Time is of the essence. Execution of Contract Documents by Contractor shall constitute its acknowledgement that City will actually sustain damages in the form of Contract administration expenses (such as Project management and consultant expenses) in the amount fixed in the Contract Documents for each and every Day during which completion of Work required is delayed beyond expiration of time fixed for completion plus extensions of time allowed pursuant to provisions hereof.

B. Contractor and City agree that because of the nature of the Project, it would be impractical or extremely difficult to fix the amount of such actual damages incurred by City because of a delay in completion of all or any part of the Work. Contractor and City agree that specified measures of liquidated damages shall be presumed to be the amount of such damages actually sustained by City, and that because of the nature of the Project, it would be impracticable or extremely difficult to fix the actual damages.

C. Liquidated damages for delay shall cover administrative, overhead, interest on bonds, and general loss of public use damages suffered by City as a result of delay. Liquidated damages shall not cover the cost of completion of the Work, damages resulting from Defective Work, lost revenues or costs of substitute facilities, or damages suffered by others who then seek to recover their damages from City (for example, delay claims of other contractors, subcontractors, tenants, or other third-parties), and defense costs thereof. City may deduct from any money due or to become due to Contractor subsequent to time for completion of entire Work and extensions of time allowed pursuant to provisions hereof, a sum representing then-accrued liquidated damages.

ARTICLE 12 – CLAIMS BY CONTRACTOR

12.01 Obligation to File Claims for Disputed Work

A. Should it appear to Contractor that the Work to be performed or any of the matters relative to the

Contract Documents are not satisfactorily detailed or explained therein, or should any questions arise as to the meaning or intent of the Contract Documents, or should any dispute arise regarding the true value of any work performed, work omitted, extra work that the Contractor may be required to perform, time extensions, payment to the Contractor during performance of this Contract, performance of the Contract, and/or compliance with Contract procedures, or should Contractor otherwise seek extra time or compensation FOR ANY REASON WHATSOEVER, then Contractor shall first follow procedures set forth in the Contract (including but not limited to other Articles of this Document 00 7200 and Section 01 2600.) If a dispute remains, then Contractor shall give written notice to City that expressly invokes this Article 12. City shall decide the issue in writing within 15 calendar days; and City's written decision shall be final and conclusive. If Contractor disagrees with City's decision, or if Contractor contends that City failed to provide a decision timely, then Contractor's SOLE AND EXCLUSIVE REMEDY is to promptly file a written claim setting forth Contractor's position as required herein.

12.02 Form And Contents Of Claim

A. Contractor's written claim must identify itself as a "Claim" under this Article 12 and must include the following: (1) a narrative of pertinent events; (2) citation to contract provisions; (3) theory of entitlement; (4) complete pricing of all cost impacts; (5) a time impact analysis of all time delays that shows actual time impact on the critical path; (6) documentation supporting items 1 through 5; a verification under penalty of perjury of the claim's accuracy. The Claim shall be submitted to City within thirty (30) calendar days of receiving City's written decision, or the date Contractor contends such decision was due, and shall be priced like a change order according to Section 01 2600, and must be updated monthly as to cost and entitlement if a continuing claim. Routine contract materials, for example, correspondence, RFI, Change Order requests, or payment requests shall not constitute a claim. Contractor shall bear all costs incurred in the preparation and submission of a claim.

12.03 Administration During/After Claim Submission

A. City may render a final determination based on the Claim or may in its discretion conduct an administrative hearing on Contractor's claim, in which case Contractor shall appear, participate, answer questions and inquiries, and present any further evidence or analysis requested by City prior to rendering a final determination. Should City take no action on the Claim within 45 calendar days of submission, it shall be deemed denied.

B. Notwithstanding and pending the resolution of any claim or dispute, Contractor shall diligently prosecute the disputed work to final completion in accordance with City's determination.

C. After their submission, claims less than $375,000 shall also be subject to the Local Agency Disputes Act.

12.04 Compliance

A. The provisions of this Article 12 constitute a non-judicial claim settlement procedure that, pursuant to Section 930.2 of the California Government Code, shall constitute a condition precedent to submission of a valid Government Code Claim under the California Government Code. Contractor shall bear all costs incurred in the preparation, submission and administration of a claim. Any claims presented in accordance with the Government Code must affirmatively indicate Contractor's prior compliance with the claims procedure herein and the previous dispositions under Paragraph 12.3 above of the claims asserted. Pursuant to Government Code Section 930.2, the one-year period in Government Code section 911.2 shall be reduced to 150 calendar days from either accrual of the cause of action, substantial completion or termination of the contract, whichever occurs first; in all other respects, the Government Code shall apply unchanged.

B. Failure to submit and administer claims as required in Article 12 shall waive Contractor's right to claim on any specific issues not included in a timely submitted claim. Claim(s) or issue(s) not raised in a timely protest and timely claim submitted under this Article 12 may not be asserted in any subsequent litigation, Government Code Claim, or legal action.

C. City shall not be deemed to waive any provision under this Article 12, if at City's sole discretion, a

claim is administered in a manner not in accord with this Article 12. Waivers or modifications of this Article 12 may only be made a signed change order approved as to form by legal counsel for both City and Contractor; oral or implied modifications shall be ineffective.

ARTICLE 13 – UNDERGROUND CONDITIONS

13.01 Contractor To Locate Underground Facilities.

A. During construction, Contractor shall comply with Government Code Sections 4216 to 4216.9, and in particular Section 4216.2 which provides, in part: "Except in an emergency, every person planning to conduct any excavation shall contact the appropriate regional notification center at least two working days, but no more than 14 calendar days, prior to commencing that excavation, if the excavation will be conducted in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the excavator, and, if practical, the excavator shall delineate with white paint or other suitable markings the area to be excavated. The regional notification center shall provide an inquiry identification number to the person who contacts the center and shall notify any member, if known, who has a subsurface installation in the area of the proposed excavation."

B. Contractor shall contact USA, and schedule the Work to allow ample time for the center to notify its members and, if necessary, for any member to field locate and mark its facilities. Contractor is charged with knowledge of all subsurface conditions reflected in USA records. Prior to commencing excavation or trenching work, Contractor shall provide City with copies of all USA records secured by Contractor. Contractor shall advise City of any conflict between information provided in Document 00 3132 (Geotechnical Data and Existing Conditions), the Drawings and that provided by USA records. Contractor's excavation shall be subject to and comply with the Contract Documents.

C. Contractor shall also investigate the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site, even if not shown or indicated in Document 00 3132 (Geotechnical Data and Existing Conditions), the Drawings or that provided by USA records. Contractor shall immediately secure all such available information and notify City and the utility owner, in writing, of its discovery.

13.02 Contractor To Protect Underground Facilities.

A. At all times during construction, all operating Underground Facilities shall remain in operation, unless the Contract Documents expressly indicate otherwise. Contractor shall maintain such Underground Facilities in service where appropriate; shall repair any damage to them caused by the Work; and shall incorporate them into the Work, including reasonable adjustments to the design location (including minor relocations) of the existing or new installations. Contractor shall take immediate action to restore any in service installations damaged by Contractor's operations.

B. Prior to performing Work at the Site, Contractor shall lay out the locations of Underground Facilities that are to remain in service and other significant known underground installations indicated by the Underground Facilities Data. Contractor shall further locate, by carefully excavating with small equipment, potholing and principally by hand, all such utilities or installations that are to remain and that are subject to damage. If additional utilities whose locations are unknown are discovered, Contractor shall immediately report to City for disposition of the same. Additional compensation or extension of time on account of utilities not shown or otherwise brought to Contractor's attention, including reasonable action taken to protect or repair damage, shall be determined as provided in this Document 00 7200.

C. If during construction, an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the materials supplied by City for bidding or in information on file at USA or otherwise reasonably available to Contractor, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby (and in no event later than seven calendar days), and prior to performing any Work in connection therewith (except in an emergency), identify the owner of such Underground Facility and give written notice to that owner and to City. During such time, Contractor shall be responsible for the

safety and protection of such Underground Facility.

D. The cost of all of the following will be included in the Contract Sum and Contractor shall have full responsibility for (a) reviewing and checking all available information and data including, but not limited to, information made available for bidding and information on file at USA; (b) locating all Underground Facilities shown or indicated in the Contract Documents, available information, or indicated by visual observation including, but not limited to, and by way of example only, engaging qualified locating services and all necessary backhoeing and potholing; (c) coordination of the Work with the owners of such Underground Facilities during construction; and (d) the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

E. Consistent with California Government Code §4215, as between City and Contractor, City will be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Site only if such utilities are not identified in the Contract Documents or information made available for bidding. City will compensate for the cost of locating and repairing damage not due to Contractor's failure to exercise reasonable care, removing and relocating such main or trunk line utility facilities not indicated in the Contract Documents or information made available for bidding with reasonable accuracy, and equipment on the Project necessarily idled during such Work. Contractor shall not be assessed liquidated damages for delay in completion of the Project, when such delay was caused by the failure of City or the utility to provide for removal or relocation of such utility facilities.

13.03 Concealed Or Unknown Conditions

A. If either of the following conditions is encountered at Site when digging trenches or other excavations that extend deeper than four feet below the surface, Contractor shall give a written Notice of Differing Site Conditions to City promptly before conditions are disturbed, except in an emergency as set forth in this Document 00 7200, and in no event later than seven calendar days after first observance of:

1. Subsurface or Latent physical conditions which differ materially from those indicated in the Contract Documents; or
2. Unknown physical conditions of an unusual nature or which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

B. In response to Contractor's Notice of Differing Site Conditions under this Paragraph, City will investigate the identified conditions, and if they differ materially and cause increase or decrease in Contractor's cost of, or time required for, performance of any part of the Work, City will negotiate the appropriate change order following the procedures set forth in the Contract Documents. If City determines that physical conditions at the Site are not Latent or are not materially different from those indicated in Contract Documents or that no change in terms of the Contract Documents is justified, City will so notify Contractor in writing, stating reasons (with Contractor retaining its rights under Article 12 of this Document 00 7200.)

C. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed Latent or materially different Site conditions (whether above or below grade) if Contractor knew or should have known of the existence of such conditions at the time Contractor submitted its Bid, failed to give proper notice, or relied upon information, conclusions, opinions or deductions of the kind that the Contract Documents preclude reliance upon.

D. Regarding Underground Facilities, Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that is owned and was built by City only where the Underground Facility:

1. Was not shown or indicated in the Contract Documents or in the information supplied for bidding purposes or in information on file at USA; and
2. Contractor did not know of it; and
3. Contractor could not reasonably have been expected to be aware of it or to have anticipated it from the information available. (For example, if surface conditions such as

pavement repairs, valve covers, or other markings, indicate the presence of an Underground Facility, then an increase in the Contract Sum or an extension of the Contract Time will not be due, even if the Underground Facility was not indicated in the Contract Documents, in the information supplied to Contractor for bidding purposes, in information on file at USA, or otherwise reasonably available to Contractor.)

E. Contractor shall bear the risk that Underground Facilities not owned or built by City may differ in nature or locations shown in information made available by City for bidding purposes, in information on file at USA, or otherwise reasonably available to Contractor. Underground Facilities are inherent in construction involving digging of trenches or other excavations on City's Project, and Contractor is to apply its skill and industry to verify the information available.

F. Contractor's compensation for claimed Latent or materially different Site conditions shall be limited to the actual, reasonable, incremental increase in cost of that portion of the Work, resulting from the claimed Latent or materially different Site conditions. Such calculation shall take into account the estimated value of that portion of the Work and the actual value of that portion of the Work, using for guidance Contractor's or its subcontractor's bid amount and actual amounts incurred for that portion of the Work and the reasonable expectation (if any) of differing or difficult site conditions in the Work area based on the available records and locale of the Work. For example, if Contractor excavates in an area unexpected, then such costs would be recoverable entirely; while if Contractor extends an existing excavation, then such costs would be recoverable if the resulting excavation costs in that work area exceeded the reasonable expectations therefore.

13.04 Notice Of Hazardous Waste Or Materials Conditions

A. Contractor shall give a written Notice of Hazardous Materials Condition to City promptly, before any of the following conditions are disturbed (except in an emergency as set forth in this Document 00 7200), and in no event later than 24 hours after first observance of any:

1. Material that Contractor believes may be hazardous waste or hazardous material, as defined in Section 25117 of the Health and Safety Code (including, without limitation, Asbestos, lead, PCBs, petroleum and related hydrocarbons, and radioactive material) that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law ("hazardous material"); or
2. Other material that may present an imminent substantial danger to persons or property exposed thereto in connection with Work at the Site ("other materials").

B. Except as otherwise provided in the Contract Documents or as provided by applicable law, Contractor shall not be required to give any notice for the disturbance or observation of any such hazardous materials or other materials where such matter is disturbed or observed as part of the scope of Work under the Contract Documents (such as hazardous waste or hazardous material investigation, remediation or disposal activities which are identified as the subject of Work under the Contract Documents), where Contractor complies with all requirements in the Contract Documents and applicable law respecting such materials.

C. Contractor's Notice of Hazardous Materials Condition shall indicate whether the hazardous materials or other materials were shown or indicated in the Contract Documents to be within the scope of Work, and whether the hazardous materials or other materials were brought to the Site by Contractor, its Subcontractors, suppliers, or anyone else for whom Contractor is responsible.

D. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed hazardous waste or materials if:

1. Contractor knew of the existence of such hazardous materials or other materials at the time Contractor submitted its Bid; or
2. Contractor should have known of the existence of such hazardous material or other materials as a result of its having the responsibility to obtain additional or supplementary examinations, investigation, explorations, tests, studies, and data concerning the conditions at or contiguous to the Site prior to submitting its Bid; or
1. Contractor failed to give the written notice within the required timeframe set forth below.

E. If City determines that conditions involve hazardous materials or other materials and that a

change in Contract Document terms is justified, City will issue either a Request for Proposal or Construction Change Directive under the procedures described in the Contract Documents. If City determines that conditions do not involve hazardous materials or other materials or that no change in Contract Document terms is justified, City will notify Contractor in writing, stating the reasons for its determination.

F. In addition to the parties' other rights under this Document 00 7200, if Contractor does not agree to resume Work based on a reasonable belief that it is unsafe, or does not agree to resume Work under special conditions, City may order the disputed portion of Work deleted from the Work, or performed by others, or City may invoke its right to terminate Contractor's right to proceed under the Contract Documents in whole or in part, for convenience or for cause as the facts may warrant.

G. If Contractor does not agree with any City determination of any adjustment in the Contract Sum or Contract Time under this Article, Contractor may make a claim as provided in Article 12 of this Document 00 7200.

ARTICLE 14 – LEGAL AND MISCELLANEOUS

14.01 Laws And Regulations

A. Contractor shall keep fully informed of and shall comply with all laws, ordinances, regulations and orders of any properly constituted authority affecting the Contract Documents, Work and persons connected with Work, and shall protect and indemnify City and its officers, employees, consultants and agents against any claim or liability, including attorney's fees, arising from or based on violation of law, ordinance, regulation or order, whether by Contractor or by Subcontractors, employees or agents. Authorized persons may at any time enter upon any part of Work to ascertain compliance of all applicable laws, ordinances, regulations and orders.

14.02 Permits And Taxes

A. Contractor shall procure all permits and licenses applicable to the Work (including environmental matters to the extent applicable); pay all charges and fees, including fees for street opening permits; comply with, implement and acknowledge effectiveness of all permits; initiate and cooperate in securing all required notifications or approvals therefore; and give all notices necessary and incident to due and lawful prosecution of Work, unless otherwise provided herein. City will pay applicable building permits, sanitation and water fees for the completed construction, except as otherwise provided in the Contract Documents. Contractor shall pay all sales and/or use taxes levied on materials, supplies, or equipment purchased and used on or incorporated into Work, and all other taxes properly assessed against equipment or other property used in connection with Work, without any increase in the Contract Sum. Contractor shall make necessary arrangements with proper authorities having jurisdiction over roads, streets, pipelines, navigable waterways, railroads, and other works in advance of operations, even where City may have already obtained permits for the Work.

14.03 Communications And Information Distribution

A. All communications recognized under the Contract Documents shall be in writing, in the form of a serialized document, by type of communication. For example, RFI's shall be serialized beginning with RFI No. 1; payment applications shall be serialized beginning with Payment Application No. 1, submittals shall be serialized per specification section and transmitted with transmittal sheets beginning with Transmittal No. 1; and correspondence shall be serialized beginning with letter No. 1. Contractor may propose other record management and identification systems or protocols, intended to facilitate orderly transmittal of project information, storage and retrieval of such information, which City will review consistent with these stated objectives, and accept or reject in its sole discretion.

B. Documents Requiring Signatures. All documents requiring signatures for approval prior to implementing action, as stipulated in other portions of Contract Documents, shall require a manually signed, serialized letter delivered to the other party at its address for notice otherwise specified in the Contract Documents, either personally or by mail.

C. Electronic data transfer of such correspondence will serve to expedite preliminary concurrence of information, only. Receipt of "hard copy" signature on forms is required prior to implementing action or work as the conditions may require. For example, change orders and authorizations for extra cost, require signatures. A party may acknowledge receipt of PDF copies of required correspondence by e-mail, but in the absence of such acknowledgment, mail or personal delivery is required.

D. All emails shall be copied to City's and Contractor's Project Representative. City reserves the right to preclude e-mail communication, in whole or in part, as Project needs may require. Communication between City and Contractor shall not be via Twitter, Facebook, or other types of instant text message systems. Any such communications shall be inadmissible for any purpose related to this Contract.

14.04 Suspension Of Work

A. City may, without cause, order Contractor in writing to suspend, delay or interrupt Work in whole or in part for such period of time as City may determine. An adjustment shall be made for increases in cost of performance of Work of the Contract Documents caused by any such suspension, delay or interruption, calculated using the measures set forth in Section 01 2600 (Modification Procedures). No adjustment shall be made to extent that performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible.

14.05 Termination Of Contract For Cause

A. The Contractor shall be in default of the Contract Documents and City may terminate the Contractor's right to proceed under the Contract Documents, for cause, in whole or in part, should the Contractor commit a material breach of the Contract Documents and not cure such breach within ten (10) calendar days of the date of notice from City to the Contractor demanding such cure; or, if such breach is curable but not curable within such ten (10) day period, within such period of time as is reasonably necessary to accomplish such cure. (In order for the Contractor to avail itself of a time period in excess of 10 calendar days, the Contractor must provide City within the ten (10) day period with a written plan acceptable to City that demonstrates actual resources, personnel and a schedule to promptly to cure said breach, and then diligently commence and continue such cure according to the written plan).

B. In the event of termination by City for cause as provided herein, the Contractor shall deliver to City possession of the Work in its then condition, including but not limited to, all designs, engineering, Project records, cost data of all types, plans and specifications and contracts with vendors and subcontractors, all other documentation associated with the Project, and all construction supplies and aids dedicated solely to performing the Work which, in the normal course of construction, would be consumed or only have salvage value at the end of the construction period. The Contractor shall remain fully liable for the failure of any Work completed and materials and equipment provided through the date of such termination to comply with the provisions of the Contract Documents. The provisions of this Section shall not be interpreted to diminish any right which City may have to claim and recover damages for any breach of the Contract Documents or otherwise, but rather, the Contractor shall compensate City for all loss, cost, damage, expense, and/or liability suffered by City as a result of such termination and/or failure to comply with the Contract Documents.

C. In the event a termination for cause is later determined to have been made wrongfully or without cause, then the termination shall be treated as a termination for convenience, and the Contractor shall have no greater rights than it would have had following a termination for convenience. Any Contractor claim arising out of a termination for cause shall be made in accord with Article 12 herein. No other loss, cost, damage, expense or liability may be claimed, requested or recovered by the Contractor.

14.06 Termination Of Contract For Convenience

A. City may terminate performance of the Work under the Contract Documents in accordance with this clause in whole, or from time to time in part, whenever City shall determine that termination is

in City's best interest. Termination shall be effected by City delivering to the Contractor notice of termination specifying the extent to which performance of the Work under the Contract Documents is terminated, and the effective date of the termination.

B. Contractor shall comply strictly with City's direction regarding the effective date of the termination, the extent of the termination, and shall stop work on the date and to the extent specified.

C. Contractor shall be entitled to a total payment on account of the Contract work so terminated measured by (i.) the actual cost to Contractor of Work actually performed, up to the date of the termination, with profit and overhead limited to twelve percent (12%) of actual cost of work performed, up to but not exceeding the actual contract value of the work completed as measured by the Schedule of Values and Progress Schedule, (ii.) offset by payments made and other contract credits. In connection with any such calculation, however, City shall retain all rights under the Contract Documents, including but not limited to claims, indemnities, or setoffs.

D. Under no circumstances may Contractor recover legal costs of any nature, nor may Contract recover costs incurred after the date of the termination.

14.07 Contingent Assignment Of Subcontracts

A. Contractor hereby assigns to City each Subcontract for a portion of the Work, provided that:

1. The assignment is effective only after City's termination of Contractor's right to proceed under the Contract Documents (or portion thereof relating to that Subcontract) as set forth herein.
2. The assignment is effective only for the Subcontracts which City expressly accepts by notifying the Subcontractor in writing;
3. The assignment is subject to the prior rights, if any, of the Surety, obligated by Document 00 6113.13 (Construction Performance Bond) provided under the Contract Documents, where the Surety exercises its rights to complete the Contract;
4. After the effectiveness of an assignment, Contractor shall, at its sole cost and expense (except as otherwise provided in this Document 00 7200), sign all instruments and take all actions reasonably requested by City to evidence and confirm the effectiveness of the assignment in City; and
5. Nothing in this Paragraph shall modify or limit any of Contractor's obligations to City arising from acts or omissions occurring before the effectiveness of any Subcontract assignment, including but not limited to all defense, indemnity and hold-harmless obligations arising from or related to the assigned Subcontract.

14.08 Remedies And Contract Integration

A. Subject to Contract Documents provisions regarding Contractor claims, claim review, and claim resolution, and subject to the limitations therein, the exclusive jurisdiction and venue for resolving all claims, counter claims, disputes and other matters in question between City and Contractor arising out of or relating to Contract Documents, any breach thereof or the Project shall be the applicable court of competent jurisdiction located in the State and County where the Project is located. All City remedies provided in the Contract Documents shall be taken and construed as cumulative and not exclusive; that is, in addition to each and every other remedy herein provided; and in all instances City shall have any and all other equitable and legal rights and remedies which it would have according to law.

B. The Contract Documents, any Contract Modifications and Change Orders, shall represent the entire and integrated agreement between City and Contractor regarding the subject matters hereof and thereof and shall constitute the exclusive statement of the terms of the parties' agreement. The Contract Documents, and any Contract Modifications and Change Orders, shall supersede any and all prior negotiations, representations or agreements, written or oral, express or implied, that relate in any way to the subject matter of the Contract Documents or written Modifications. City and Contractor represent and agree that, except as otherwise expressly provided in the Contract Documents, they are entering into the Contract Documents and any subsequent written Modification in sole reliance upon the information set forth or referenced in the Contract Documents or Contract Modifications; the parties are not and will not rely on any other

information, which shall be inadmissible in any proceeding to enforce these documents.

C. Either party's waiver of any breach or failure to enforce any of the terms, covenants, conditions or other provisions of the Contract Documents at any time shall not in any way affect, limit, modify or waive that party's right thereafter to enforce or compel strict compliance with every term, covenant, condition or other provision hereof, any course of dealing or custom of the trade or oral representations notwithstanding.

D. Neither acceptance of the whole or any part of Work by City nor any verbal statements on behalf of City or its authorized agents or representatives shall operate as a waiver or modification of any provision of the Contract Documents, or of any power reserved to City herein nor any right to damages provided in the Contract Documents.

14.09 Interpretation.

A. Should any part, term or provision of this Agreement or any of the Contract Documents, or any document required herein or therein to be executed or delivered, be declared invalid, void or unenforceable, all remaining parts, terms and provisions shall remain in full force and effect and shall in no way be invalidated, impaired or affected thereby. If the provisions of any law causing such invalidity, illegality or unenforceability may be waived, they are hereby waived to the end that this Agreement and the Contract Documents may be deemed valid and binding agreements, enforceable in accordance with their terms to the greatest extent permitted by applicable law. In the event any provision not otherwise included in the Contract Documents is required to be included by any applicable law, that provision is deemed included herein by this reference (or, if such provision is required to be included in any particular portion of the Contract Documents, that provision is deemed included in that portion).

B. Contract Documents shall not be construed to create a contractual relationship of any kind between (1) Project Manager or any City's representative and Contractor; (2) City and/or its Representatives and a Subcontractor, sub-Subcontractor, or supplier of any Project labor, materials, or equipment; or (3) between any persons or entities other than City and Contractor.

14.10 Patents

A. Fees or claims for any patented invention, article or arrangement that may be used upon or in any manner connected with performance of the Work or any part thereof shall be included in the Bid price for doing the Work. Contractor shall defend, indemnify and hold harmless City and each of its officers, employees, consultants and agents, including, but not limited to, the Board and each City's Representative, from all damages, claims for damages, costs or expenses in law or equity, including attorney's fees, arising from or relating to any claim that any article supplied or to be supplied under the Contract Documents infringes on the patent rights, copyright, trade name, trademark, service mark, trade secret or other intellectual property right of any person or persons or that the person or entity supplying the article does not have a lawful right to sell the same. Such costs or expenses for which Contractor agrees to indemnify and hold harmless the above indemnities include but are not limited to any and all license fees, whether such fees are agreed by any indemnitee or ordered by a court or administrative body of any competent jurisdiction.

14.11 Substitution For Patented And Specified Articles

A. Except as noted specifically in the instructions to Bidders or in Contract Documents, whenever in Specifications, material or process is designated by patent or proprietary name or by name of manufacturer, such designation shall be deemed to be used for purpose of facilitating description of material and process desired, and shall be deemed to be followed by the words "or Approved Equal" and Contractor may offer any substitute material or process that Contractor considers "equal" in every respect to that so designated and if material or process offered by Contractor is, in opinion of City, Equal in every respect to that so designated, its use will be approved. However, Contractor may utilize this right only by timely submitting Document 00 6325 (Substitution Request Form) as provided in Document 00 2113 (Instructions to Bidders). A substitution will be approved only if it is a true "or equal" item in every aspect of its design and quality, including but not limited to its dimensions, weights, service requirements, durability, functioning, impact on contiguous construction elements, overall schedule and design.

14.12 Interest Of Public Officers

A. No representative, officer, or employee of City no member of the governing body of the locality in which the Project is situated, no member of the locality in which City was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the Project, during the tenure of the official or for one year thereafter, shall, as principal, agent, attorney or otherwise, be directly or indirectly interested, in the Contract Documents or the proceeds thereof.

14.13 Limit Of Liability

A. CITY, AND EACH OF ITS OFFICERS, BOARD MEMBERS, EMPLOYEES, CONSULTANTS AND AGENTS INCLUDING, BUT NOT LIMITED TO, PROJECT MANAGER AND EACH OTHER CITY REPRESENTATIVE, SHALL HAVE NO LIABILITY TO CONTRACTOR FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, EXCEPT TO THE LIMITED EXTENT THAT THESE CONTRACT DOCUMENTS OR APPLICABLE PUBLIC CONTRACTING STATUTES MAY SPECIFY THEIR RECOVERY.

ARTICLE 15 – WORKING CONDITIONS AND PREVAILING WAGES

15.01 Use Of Site/Sanitary Rules

A. All portions of the Work shall be maintained at all times in neat, clean and sanitary condition. Contractor shall furnish toilets for use of Contractor's and Subcontractors' employees on the Site where needed, and their use shall be strictly enforced. All toilets shall be properly secluded from public observation, and shall be located, constructed and maintained subject to City's approval.

B. Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Site and land areas identified in and permitted by Contract Documents and other land and areas permitted by applicable laws and regulations, rights of way, permits and easements or as designated by City, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, any improvement located thereon, or to City or occupant thereof resulting from the performance of Work.

C. During the progress of the Work, Contractor shall keep the Site and the Project free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall clean the site, remove all waste materials, rubbish and debris from and about the Site as well as all tools, appliances, construction equipment and machinery and surplus materials. Contractor shall leave the premises clean and ready for occupancy by City at Substantial Completion of Work. Contractor shall restore to original condition all property not designated for alteration by Contract Documents.

D. Contractor shall not load nor permit any part of any structure or pavement to be loaded in any manner that will endanger the structure or pavement, nor shall Contractor subject any part of Work or adjacent property to stresses or pressures that will endanger it. Contractor shall conduct all necessary existing conditions investigation regarding structural, mechanical, electrical or any other system existing, shall perform Work consistent with such existing conditions, and shall have full responsibility for insufficiencies or damage resulting from insufficiencies of existing systems, equipment or structures to accommodate performing the Work.

15.02 Protection Of Work, Persons, And Property

A. Contractor shall be responsible for initiating, maintaining and supervising all safety and site security precautions and programs in connection with Work, and shall develop and implement a site security and safety plan throughout construction. Contractor shall comply with all safety requirements specified in any safety program established by City, or required by state, federal or local laws and ordinances. Contractor shall be responsible for all theft or damage to Work, property or structures, and all injuries to persons, either on the Site or constituting the Work (e.g., materials in transit), arising from the performance of Work of the Contract Documents from a cause.

B. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property.

C. Contractor shall remedy all damage, injury or loss to any property referred to above in this Article, caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, supplier, or any other person or organization directly or indirectly employed by any of them to perform or furnish any Work or anyone for whose acts any of them may be liable. Contractor's duties and responsibility for safety and for protection of Work shall continue until such time as all the Work is completed and Final Acceptance of the Work. City and its agents do not assume any responsibility for collecting any indemnity from any person or persons causing damage to Contractor's Work.

D. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

E. City may, at its option, retain such moneys due under the Contract Documents as City deems necessary until any and all suits or claims against Contractor for injury to persons or property shall be settled and City receives satisfactory evidence to that effect.

F. Work within the right-of-way lines of the city and/or City and/or State shall be done in accordance with the standards and specifications of the controlling agency. Permit for such work shall be obtained and paid for by the Contractor before executing the work within such right-of-ways.

15.03 Responsibility For Safety And Health

A. Contractor shall ensure that its and each tier of Subcontractors' employees, agents and invitees comply with applicable health and safety laws while at the Site. These laws include the Occupational Safety and Health Act of 1970 and rules and regulations issued pursuant thereto, and City's safety regulations as amended from time to time. Contractor shall comply with all City directions regarding protective clothing and gear.

B. Contractor shall be fully responsible for the safety of its and its Subcontractors' employees, agents and invitees on the Site. Contractor shall notify City, in writing, of the existence of hazardous conditions, property or equipment at the Site that are not under Contractor's control. Contractor shall be responsible for taking all the necessary precautions against injury to persons or damage to the property of Contractor, Subcontractors or persons from recognized hazards until the responsible party corrects the hazard.

C. Contractor shall confine all persons acting on its or its Subcontractors' behalf to that portion of the Site where Work under the Contract Documents is to be performed, City-designated routes for ingress and egress thereto, and any other City-designated area. Except those routes for ingress and egress over which Contractor has no right of control, within such areas, Contractor shall provide safe means of access to all places at which persons may at any time have occasion to be present.

15.04 Emergencies

A. In emergencies affecting the safety or protection of persons or Work or property at the Site or adjacent thereto, Contractor, without special instruction or authorization from City, is obligated to act to prevent threat and damage, injury or loss, until directed otherwise by City. Contractor shall give City prompt written notice if Contractor believes that any significant changes in Work or variations from Contract Documents have been caused thereby. If City determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Change Order or Construction Change Directive will be issued to document the consequences of such action.

15.05 Use Of Roadways And Walkways

A. Contractor shall not unnecessarily interfere with use of any roadway, walkway or other facility for

vehicular or pedestrian traffic. Before beginning any interference and only with City's prior concurrence, Contractor may provide detour or temporary bridge for traffic to pass around or over the interference, which Contractor shall maintain in satisfactory condition as long as interference continues. Unless otherwise provided in the Contract Documents, Contractor shall bear the cost of these temporary facilities.

15.06 Nondiscrimination

A. No person or entity shall discriminate in the employment of persons upon public works because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sexual preference, or gender of such persons, except as provided in Section 12940 of the California Government Code. Every contractor for public works violating the provisions of Section 1735 of the California Labor Code is subject to all the penalties imposed for a violation of Chapter 1, Part 7, Division 2 of the California Labor Code.

15.07 Prevailing Wages And Working Hours

A. Contractor shall pay to persons performing labor in and about Work provided for in the Contract Documents an amount equal to or more than the general prevailing rate of per diem wages for (1) work of a similar character in the locality in which the Work is performed and (2) legal holiday and overtime work in said locality. The per diem wages shall be an amount equal to or more than the stipulated rates contained in a schedule that has been ascertained and determined by the Director of the State Department of Industrial Relations and City to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this Contract. Contractor shall also cause a copy of this determination of the prevailing rate of per diem wages to be posted at each Site.

B. Contractor shall forfeit, as a penalty to City, Fifty Dollars ($50.00) for each laborer, workman, or mechanic employed in performing labor in and about the Work provided for in the Contract Documents for each Day, or portion thereof, that such laborer, workman or mechanic is paid less than the said stipulated rates for any Work done under the Contract Documents by him or her or by any Subcontractor under him or her, in violation of Articles 1 and 2 of Chapter 1 of Part 7 of Division II of the California Labor Code. The sums and amounts which shall be forfeited pursuant to this Paragraph and the terms of the California Labor Code shall be withheld and retained from payments due to Contractor under the Contract Documents, pursuant to this Document 00 7200 and the California Labor Code, but no sum shall be so withheld, retained or forfeited except from the final payment without a full investigation by either the State Department of Industrial Relations or by City. The Labor Commissioner pursuant to California Labor Code §1775 shall determine the final amount of forfeiture.

C. Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, provision that Subcontractor shall pay persons performing labor or rendering service under subcontract or other arrangement not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed in the California Labor Code.

D. Contractor stipulates that it shall comply with all applicable wage and hour laws, including without limitation, California Labor Code §§ 1776 and 1810-1815. Failure to so comply shall constitute a default under this Contract.

E. Contractor and its Subcontractors shall be responsible for compliance with Labor Code §§ 1810-1815.

1. Eight hours of labor performed in execution of the Contract constitutes a legal day's work. The time of service of any workman employed on the Project is limited and restricted to 8 hours during any one calendar day, and 40 hours during any one calendar week.
2. Contractor and its Subcontractors shall keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by him or her in connection with the Project. The record shall be kept open at all reasonable hours to the inspection City and to the Division of Labor Standards Enforcement.

3. Contractor or its Subcontractors shall, as a penalty to City, forfeit twenty-five dollars ($25) for each worker employed in the execution of the Contract Documents by the respective Contractor or Subcontractor for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of Labor Code §§ 1810-1815.
4. Work performed on the Project by employees of Contractor or its Subcontractors 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 at not less than 1 1/2 times the basic rate of pay.

F. Contractor and its Subcontractors shall be responsible for compliance with Labor Code Section 1776.
1. Contractor and Subcontractors must 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 him or her in connection with the Work of the Contract Documents. Each payroll record shall contain or be verified by a written declaration as required by Labor Code Section 1776.
2. The payroll records enumerated above must be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor as required by Labor Code Section 1776.
    a. Contractor shall inform City of the location of records enumerated above, including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.
    b. Contractor or Subcontractor has 10 calendar days in which to comply subsequent to receipt of a written notice requesting the records enumerated above. In the event that the Contractor or Subcontractor fails to comply with the ten-day period, he or she shall, as a penalty to City on whose behalf the contract is made or awarded, forfeit $25.00 for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. Contractor is not subject to a penalty assessment pursuant to this Paragraph due to the failure of a Subcontractor to comply with this Paragraph.
3. Contractor shall also deliver certified payrolls to City with each Application for Payment as set forth above in this Document 00 7200 (General Conditions).

15.08 Environmental Controls

A. Contractor shall comply with all rules, regulations, ordinances, and statutes that apply to any Work performed under the Contract Documents including, without limitation, any toxic, water, stormwater management and soil pollution controls and air pollution controls specified in California Government Code §11017. Contractor shall be responsible for insuring that Contractor's Employees, Subcontractors, and the public are protected from exposure to airborne hazards or contaminated water, soil, or other toxic materials used during or generated by activities on the Site or associated with the Project.

15.09 Shoring Safety Plan

A. Any conflict between this Paragraph and Division 2 of the Specifications shall be resolved in favor of the most stringent requirement.

B. At least five calendar days in advance of any excavation five feet or more in depth, Contractor shall submit to City a detailed plan showing the shoring, bracing and sloping design (including calculations) and other provisions to be made for worker protection from the hazard of caving ground during the excavation, as required by California Labor Code §6705. A civil or structural engineer registered in California shall prepare and sign any plan that varies from the shoring system standards established by the State Construction Safety Orders.

C. During the course of Work, Contractor shall be responsible for determining where sloping, shoring, and/or bracing is necessary and the adequacy of the design, installation, and maintenance of all shoring and bracing for all excavation, including any excavation less than five feet in depth. Contractor will be solely responsible for any damage or injuries that may result from excavating or trenching. City's acceptance of any drawings showing the shoring or bracing design or Work schedule shall not relieve Contractor of its responsibilities under this Paragraph.

D. Appoint a qualified supervisory employee who shall be responsible to determine the sloping or shoring system to be used depending on local soil type, water table, stratification, depth, etc.

ARTICLE 16 – CONTRACTING POLICIES

16.01 First Source Hiring Requirement

A. Contractor, and any subcontractors, shall utilize the City's First Source Construction Program under the terms set forth in the First Source specifications. (Appendix 00812-C)

1. Under the First Source program, Contractor must employ, to the extent possible, a work force where no less than twenty-five percent of the work hours are performed by Berkeley residents, and fifty percent of all new hires are Berkeley residents, on a craft-by-craft basis.
2. To achieve the goals, Contractors may either:
   a. Utilize the City's First Source referral service, or
   b. Demonstrate a good faith effort to achieve the goals

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DOCUMENT 00 7201

SUPPLEMENTAL GENERAL CONDITIONS

ATTACHMENT A: HUD FORM 4010

A. APPLICABILITY

The Project or Program to which the construction work covered by this Contract pertains is being assisted by the United States of America, and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

1. Minimum wages and fringe benefits

i. All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in 29 CFR 5.5(d) and (e), the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(v) of these contract clauses; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided,* That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under 29 CFR 5.5(a)(1)(iii)) and the Davis-Bacon poster (WH-1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

ii. Frequently recurring classifications

A. In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to 29 CFR 5.5(a)(1)(iii), provided that:

1. The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

2. The classification is used in the area by the construction industry; and

3. The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

B. The Administrator will establish wage rates for such classifications in accordance with 29 CFR 5.5(a)(1)(iii)(A)(3). Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

iii. Conformance

A. The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be

classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

1. The work to be performed by the classification requested is not performed by a classification in the wage determination; and
2. The classification is used in the area by the construction industry; and
3. The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

B. The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

C. If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to DBAconformance@dol.gov. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

D. In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to DBAconformance@dol.gov, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

E. The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under 29 CFR 5.5 (a)(1)(iii)(C) and (D). The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to 29 CFR 5.5 (a)(1)(iii)(C) or (D) must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

iv. Fringe benefits not expressed as an hourly rate

Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

v. Unfunded plans

If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in 29 CFR 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

vi. Interest In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding

i. Withholding requirements

The U. S. Department of Housing and Urban Development may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in 29 CFR 5.5(a) for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in 29 CFR 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work (or otherwise working in construction or development of the project under a development statute) all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in 29 CFR 5.5(a)(3)(iv), HUD may on its own initiative and after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

ii. Priority to withheld funds

The Department has priority to funds withheld or to be withheld in accordance with 29 CFR 5.5(a)(2)(i) or (b)(3)(i), or both, over claims to those funds by:

- **A.** A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- **B.** A contracting agency for its reprocurement costs;
- **C.** A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- **D.** A contractor's assignee(s);
- **E.** A contractor's successor(s); or
- **F.** A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901-3907.

3. Records and certified payrolls

i. Basic record requirements

- **A. Length of record retention.** All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.
- **B. Information required** Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.
- **C. Additional records relating to fringe benefits***.* Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(v) that the wages of any laborer or mechanic include the amount of any

costs reasonably anticipated in providing benefits under a plan or program described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

D. **Additional records relating to apprenticeship** Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

ii. **Certified payroll requirements**

A. **Frequency and method of submission** The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to HUD if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the certified payrolls to the applicant, sponsor, owner, or other entity, as the case may be, that maintains such records, for transmission to HUD. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system

B. **Information required** The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i)(B), except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (*e.g.*, the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH-347 or in any other format desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at *https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347.pdf* or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the sponsoring government agency (or the applicant, sponsor, owner, or other entity, as the case may be, that maintains such records).

C. **Statement of Compliance** Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

1. That the certified payroll for the payroll period contains the information required to be provided under 29 CFR 5.5(a)(3)(ii), the appropriate information and basic records are being maintained under 29 CFR 5.5 (a)(3)(i), and such information and records are correct and complete;
2. That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly

from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3; and

3. That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

D. Use of Optional Form WH-347 The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the "Statement of Compliance" required by 29 CFR 5.5(a)(3)(ii)(C).

E. Signature The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

F. Falsification The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

G. Length of certified payroll retention The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

iii. Contracts, subcontracts, and related documents The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

iv Required disclosures and access

A. Required record disclosures and access to workers The contractor or subcontractor must make the records required under 29 CFR 5.5(a)(3)(i)–(iii), and any other documents that HUD or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by 29 CFR 5.1, available for inspection, copying, or transcription by authorized representatives of HUD or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

B. Sanctions for non-compliance with records and worker access requirements If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to 29 CFR 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

C. Required information disclosures Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to HUD if the agency is a party to

the contract, or to the Wage and Hour Division of the Department of Labor. If the Federal agency is not such a party to the contract, the contractor, subcontractor, or both, must, upon request, provide the full Social Security number and last known address, telephone number, and email address of each covered worker to the applicant, sponsor, owner, or other entity, as the case may be, that maintains such records, for transmission to HUD, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity

i. Apprentices

A. Rate of pay Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

B. Fringe benefits Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

C. Apprenticeship ratio The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to 29 CFR 5.5(a)(4)(i)(D). Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in 29 CFR 5.5(a)(4)(i)(A), must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

D. Reciprocity of ratios and wage rates Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

ii Equal employment opportunity The use of apprentices and journeyworkers under this part must be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

5 Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6 Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (11), along with the applicable wage determination(s) and such other clauses or contract modifications as the U.S. Department of Housing and
Urban Development may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate.

7 Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8 Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9 Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

i. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of 40 U.S.C. 3144(b) or 29 CFR 5.12(a).

ii. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or 29 CFR 5.12(a).

iii. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

11 Anti-retaliation It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

- **i.** Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, or 29 CFR parts 1, 3, or 5;
- **ii.** Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, or 29 CFR parts 1, 3, or 5;
- **iii.** Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, or 29 CFR parts 1, 3, or 5; or
- **iv.** Informing any other person about their rights under the DBA, Related Acts, or 29 CFR parts 1, 3, or 5.

B. Contract Work Hours and Safety Standards Act (CWHSSA)

The Agency Head must cause or require the contracting officer to insert the following clauses set forth in 29 CFR 5.5(b)(1), (2), (3), (4), and (5) in full, or (for contracts covered by the Federal Acquisition Regulation) by reference, in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses must

be inserted in addition to the clauses required by 29 CFR 5.5(a) or 4.6. As used in this paragraph, the terms "laborers and mechanics" include watchpersons and guards.

1. **Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
2. **Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in 29 CFR 5.5(b)(1) the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchpersons and guards, employed in violation of the clause set forth in 29 CFR 5.5(b)(1), in the sum of $31 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in 29 CFR 5.5(b)(1).
3. **Withholding for unpaid wages and liquidated damages**

i. **Withholding process** The U.S Department of Housing and Urban Development or the recipient of Federal assistance may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in 29 CFR 5.5(b) on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in 29 CFR 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

ii **Priority to withheld funds** The Department has priority to funds withheld or to be withheld in accordance with 29 CFR 5.5(a)(2)(i) or (b)(3)(i), or both, over claims to those funds by:

- **A.** A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- **B.** A contracting agency for its reprocurement costs;
- **C.** A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- **D.** A contractor's assignee(s);
- **E.** A contractor's successor(s); or
- **F.** A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901-3907.

4. ***Subcontracts***. The contractor or subcontractor must insert in any subcontracts the clauses set forth in 29 CFR 5.5(b)(1) through (5) and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in 29 CFR 5.5(b)(1) through (5). In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss,

due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5 Anti-retaliation It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

- **i.** Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in 29 CFR part 5;
- **ii.** Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or 29 CFR part 5;
- **iii.** Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or 29 CFR part 5; or
- **iv.** Informing any other person about their rights under CWHSSA or 29 CFR part 5.

C. CWHSSA required records clause In addition to the clauses contained in 29 CFR 5.5(b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other laws referenced by 29 CFR 5.1, the Agency Head must cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor must maintain regular payrolls and other basic records during the course of the work and must preserve them for a period of 3 years after all the work on the prime contract is completed for all laborers and mechanics, including guards and watchpersons, working on the contract. Such records must contain the name; last known address, telephone number, and email address; and social security number of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid; daily and weekly number of hours actually worked; deductions made and actual wages paid. Further, the Agency Head must cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph must be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview workers during working hours on the job.

D. Incorporation of contract clauses and wage determinations by reference Although agencies are required to insert the contract clauses set forth in this section, along with appropriate wage determinations, in full into covered contracts, and contractors and subcontractors are required to insert them in any lower-tier subcontracts, the incorporation by reference of the required contract clauses and appropriate wage determinations will be given the same force and effect as if they were inserted in full text.

E. Incorporation by operation of law The contract clauses set forth in this section (or their equivalent under the Federal Acquisition Regulation), along with the correct wage determinations, will be considered to be a part of every prime contract required by the applicable statutes referenced by 29 CFR 5.1 to include such clauses, and will be effective by operation of law, whether or not they are included or incorporated by reference into such contract, unless the Administrator grants a variance, tolerance, or exemption from the application of this paragraph. Where the clauses and applicable wage determinations are effective by operation of law under this paragraph, the prime contractor must be compensated for any resulting increase in wages in accordance with applicable law.

F. HEALTH AND SAFETY

The provisions of this paragraph (F) are applicable where the amount of the prime contract exceeds **$100,000**.

1. No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his or her health and safety, as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.
2. The contractor shall comply with all regulations issued by the Secretary of Labor pursuant to 29 CFR Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96), 40 U.S.C. § 3701 et seq.
3. The contractor shall include the provisions of this paragraph in every subcontract, so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

ATTACHMENT B: PREVAILING WAGE DETERMINATION

"General Decision Number: CA20230018 12/01/2023

Superseded General Decision Number: CA20220018

State: California

Construction Types: Building, Heavy (Heavy and Dredging) and Highway

Counties: Alameda, Calaveras, Contra Costa, Fresno, Kings, Madera, Mariposa, Merced, Monterey, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Stanislaus and Tuolumne Counties in California.

BUILDING CONSTRUCTION PROJECTS; DREDGING PROJECTS (does not include hopper dredge work); HEAVY CONSTRUCTION PROJECTS (does not include water well drilling); HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker

protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2023
1	01/13/2023
2	01/20/2023
3	02/10/2023
4	02/24/2023
5	03/03/2023
6	03/10/2023
7	03/17/2023
8	03/31/2023
9	04/07/2023
10	04/14/2023
11	04/21/2023
12	06/02/2023
13	06/09/2023
14	06/23/2023
15	06/30/2023
16	07/14/2023
17	07/28/2023
18	08/11/2023
19	08/18/2023
20	08/25/2023
21	09/01/2023
22	09/08/2023
23	09/22/2023
24	09/29/2023
25	10/06/2023
26	10/20/2023
27	11/03/2023
28	11/17/2023
29	12/01/2023

ASBE0016-004 01/01/2021

AREA 1: CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, STANISLAUS & TOULMNE COUNTIES

AREA 2: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO & SANTA CLARA COUNTIES

	Rates	Fringes
Asbestos Removal worker/hazardous material handler (Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging and disposing of all insulation materials from mechanical systems, whether they contain asbestos or not)		
Area 1	$ 30.45	10.60
Area 2	$ 36.53	9.27

ASBE0016-008 02/01/2023

AREA 1: ALAMEDA, CONTRA COSTA, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA, & SANTA CRUZ

AREA 2: CALAVERAS, COLUSA, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS, & TUOLUMNE

	Rates	Fringes
Asbestos Workers/Insulator (Includes the application of all insulating materials, Protective Coverings, Coatings, and Finishes to all types of mechanical systems)		
Area 1	$ 80.91	23.82
Area 2	$ 62.26	23.82

BOIL0549-001 01/01/2021

AREA 1: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO & SANTA CLARA COUNTIES

AREA 2: REMAINING COUNTIES

	Rates	Fringes
BOILERMAKER		
Area 1	$ 49.62	41.27
Area 2	$ 45.60	38.99

BRCA0003-001 08/01/2022

	Rates	Fringes
MARBLE FINISHER	$ 39.20	18.31

BRCA0003-003 08/01/2022

	Rates	Fringes
MARBLE MASON	$ 56.98	28.54

BRCA0003-005 05/01/2022

	Rates	Fringes
BRICKLAYER		
(1) Fresno, Kings, Madera, Mariposa, Merced	$ 47.88	23.29
(7) San Francisco, San Mateo	$ 53.69	26.03
(8) Alameda, Contra Costa, San Benito, Santa Clara	$ 53.61	23.81
(9) Calaveras, San Joaquin, Stanislaus, Toulumne	$ 45.12	21.55
(16) Monterey, Santa Cruz	$ 50.78	25.42

BRCA0003-008 07/01/2022

	Rates	Fringes
TERRAZZO FINISHER	$ 41.93	18.98
TERRAZZO WORKER/SETTER	$ 56.84	27.53

BRCA0003-011 04/01/2022

AREA 1: Alameda, Contra Costa, Monterey, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz

AREA 2: Calaveras, San Joaquin, Stanislaus, Tuolumne

AREA 3: Fresno, Kings, Madera, Mariposa, Merced

	Rates	Fringes
TILE FINISHER		
Area 1	$ 33.86	17.54
Area 2	$ 30.90	17.67
Area 3	$ 29.89	16.80
Tile Layer		
Area 1	$ 55.41	20.50
Area 2	$ 50.66	20.40
Area 3	$ 45.76	19.92

CARP0022-001 07/01/2023

San Francisco County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 60.39	33.52
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 60.54	33.52
Journeyman Carpenter	$ 60.39	33.52
Millwright	$ 60.49	35.11

CARP0034-001 07/01/2021

	Rates	Fringes
Diver		
Assistant Tender, ROV Tender/Technician	$ 54.10	34.69
Diver standby	$ 60.51	34.69
Diver Tender	$ 59.51	34.69
Diver wet	$ 103.62	34.69
Manifold Operator (mixed gas)	$ 64.51	34.69
Manifold Operator (Standby)	$ 59.51	34.69

DEPTH PAY (Surface Diving):
050 to 100 ft $2.00 per foot
101 to 150 ft $3.00 per foot
151 to 220 ft $4.00 per foot
221 ft.-deeper $5.00 per foot

SATURATION DIVING:
The standby rate shall apply until saturation starts. The saturation diving rate applies when divers are under pressure continuously until work task and decompression are complete. The diver rate shall be paid for all saturation hours.

DIVING IN ENCLOSURES:
Where it is necessary for Divers to enter pipes or tunnels, or other enclosures where there is no vertical ascent, the following premium shall be paid: Distance traveled from entrance 26 feet to 300 feet: $1.00 per foot. When it is necessary for a diver to enter any pipe, tunnel or other enclosure less than 48"" in height, the premium will be $1.00 per foot.

WORK IN COMBINATION OF CLASSIFICATIONS:
Employees working in any combination of classifications within the diving crew (except dive supervisor) in a shift are paid in the classification with the highest rate for that shift.

CARP0034-003 07/01/2021

	Rates	Fringes
Piledriver	$ 54.10	34.69

CARP0035-007 07/01/2020

AREA 1: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara counties

AREA 2: Monterey, San Benito, Santa Cruz Counties

AREA 3: Calaveras, Fresno, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tuolumne Counties

	Rates	Fringes
Modular Furniture Installer		
Area 1		
Installer	$ 28.76	22.53
Lead Installer	$ 32.21	23.03
Master Installer	$ 36.43	23.03
Area 2		
Installer	$ 26.11	22.53
Lead Installer	$ 29.08	23.03
Master Installer	$ 32.71	23.03
Area 3		
Installer	$ 25.16	22.53
Lead Installer	$ 27.96	23.03
Master Installer	$ 31.38	23.03

CARP0035-008 08/01/2020

AREA 1: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara counties

AREA 2: Monterey, San Benito, Santa Cruz Counties

AREA 3: San Joaquin

AREA 4: Calaveras, Fresno, Kings, Madera, Mariposa, Merced, Stanislaus, Tuolumne Counties

	Rates	Fringes

Drywall Installers/Lathers:
Area 1.....$ 52.65 31.26
Area 2.....$ 46.77 31.26
Area 3.....$ 47.27 31.26
Area 4.....$ 45.92 31.26
Drywall Stocker/Scrapper
Area 1.....$ 26.33 18.22
Area 2.....$ 23.39 18.22
Area 3.....$ 23.64 18.22
Area 4.....$ 22.97 18.22

CARP0152-001 07/01/2020

Contra Costa County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 52.65	30.82
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 52.80	30.82
Journeyman Carpenter	$ 52.65	30.82
Millwright	$ 52.75	32.41

CARP0152-002 07/01/2020

San Joaquin County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 52.65	30.82
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 46.92	30.82
Journeyman Carpenter	$ 46.77	30.82
Millwright	$ 49.27	32.41

CARP0152-004 07/01/2020

Calaveras, Mariposa, Merced, Stanislaus and Tuolumne Counties

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 52.65	30.82
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 45.57	30.82
Journeyman Carpenter	$ 45.42	30.82
Millwright	$ 47.92	32.41

CARP0217-001 07/01/2023

San Mateo County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 60.39	33.52
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 60.54	33.52
Journeyman Carpenter	$ 60.39	33.52
Millwright	$ 60.49	35.11

CARP0405-001 07/01/2021

Santa Clara County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 54.85	31.49
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 55.00	31.49
Journeyman Carpenter	$ 54.85	31.49
Millwright	$ 54.95	33.08

CARP0405-002 07/01/2021

San Benito County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 54.85	31.49
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 49.12	31.49
Journeyman Carpenter	$ 48.97	31.49
Millwright	$ 51.47	33.08

CARP0505-001 07/01/2021

Santa Cruz County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 54.85	31.49
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 49.12	31.49
Journeyman Carpenter	$ 48.97	31.49
Millwright	$ 51.47	33.08

CARP0605-001 07/01/2021

Monterey County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 54.85	31.49
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 49.12	31.49
Journeyman Carpenter	$ 48.97	31.49
Millwright	$ 51.47	33.08

CARP0701-001 07/01/2021

Fresno and Madera Counties

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 54.85	31.49
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 47.77	31.49
Journeyman Carpenter	$ 47.62	31.49
Millwright	$ 50.12	33.08

CARP0713-001 07/01/2021

Alameda County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 54.85	31.49
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 55.00	31.49
Journeyman Carpenter	$ 54.85	31.49
Millwright	$ 54.95	33.08

CARP1109-001 07/01/2021

Kings County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 54.85	31.49
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 47.77	31.49

Journeyman Carpenter.....$ 47.62 31.49
Millwright.....$ 50.12 33.08

ELEC0006-004 12/01/2021

SAN FRANCISCO COUNTY

	Rates	Fringes
Sound & Communications		
Installer	$ 48.43	3%+23.15
Technician	$ 55.69	3%+23.15

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0006-007 06/01/2023

SAN FRANCISCO COUNTY

	Rates	Fringes
ELECTRICIAN	$ 88.25	3%+42.315

ELEC0100-002 09/01/2023

FRESNO, KINGS, AND MADERA COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 44.50	28.09

ELEC0100-005 12/01/2022

FRESNO, KINGS, MADERA

	Rates	Fringes
Communications System		
Installer	$ 38.24	23.80
Technician	$ 47.80	24.08

SCOPE OF WORK
Includes the installation testing, service and maintenance, of the following systems which utilize the transmission

and/or transference of voice, sound, vision and digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background-foreground music, intercom and telephone interconnect, inventory control systems, microwave transmission, multi-media, multiplex, nurse call system, radio page, school intercom and sound, burglar alarms, and low voltage master clock systems.

A. SOUND AND VOICE TRANSMISSION/TRANSFERENCE SYSTEMS Background foreground music, Intercom and telephone interconnect systems, Telephone systems Nurse call systems, Radio page systems, School intercom and sound systems, Burglar alarm systems, Low voltage, master clock systems, Multi-media/multiplex systems, Sound and musical entertainment systems, RF systems, Antennas and Wave Guide,

B. FIRE ALARM SYSTEMS Installation, wire pulling and testing

C. TELEVISION AND VIDEO SYSTEMS Television monitoring and surveillance systems Video security systems, Video entertainment systems, Video educational systems, Microwave transmission systems, CATV and CCTV

D. SECURITY SYSTEMS Perimeter security systems Vibration sensor systems Card access systems Access control systems, Sonar/infrared monitoring equipment

E. COMMUNICATIONS SYSTEMS THAT TRANSMIT OR RECEIVE INFORMATION AND/OR CONTROL SYSTEMS THAT ARE INTRINSIC TO THE ABOVE LISTED SYSTEMS SCADA (Supervisory Control and Data Acquisition) PCM (Pulse Code Modulation) Inventory Control Systems, Digital Data Systems Broadband and Baseband and Carriers Point of Sale Systems, VSAT Data Systems Data Communication Systems RF and Remote Control Systems, Fiber Optic Data Systems

WORK EXCLUDED Raceway systems are not covered (excluding Ladder-Rack for the purpose of the above listed systems). Chases and/or nipples (not to exceed 10 feet) may be installed on open wiring systems. Energy management systems. SCADA (Supervisory Control and Data Acquisition) when not intrinsic to the above listed systems (in the scope). Fire alarm systems when installed in raceways (including wire and cable pulling) shall be performed at the electrician wage rate, when either of the following two (2) conditions apply:
1. The project involves new or major remodel building trades construction.
2. The conductors for the fire alarm system are installed in conduit.

ELEC0234-001 12/26/2022

MONTEREY, SAN BENITO AND SANTA CRUZ COUNTIES

	Rates	Fringes
ELECTRICIAN		
Zone A	$ 60.91	29.43
Zone B	$ 67.00	29.61

Zone A: All of Santa Cruz, Monterey, and San Benito Counties within 25 air miles of Highway 1 and Dolan Road in Moss

Landing, and an area extending 5 miles east and west of Highway 101 South to the San Luis Obispo County Line

Zone B: Any area outside of Zone A

ELEC0234-003 12/01/2021

MONTEREY, SAN BENITO, AND SANTA CRUZ COUNTIES

	Rates	Fringes
Sound & Communications		
Installer	$ 47.93	24.09
Technician	$ 55.12	24.30

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0302-001 02/27/2023

CONTRA COSTA COUNTY

	Rates	Fringes
CABLE SPLICER	$ 68.92	32.67
ELECTRICIAN	$ 61.26	32.44

ELEC0302-003 12/01/2022

CONTRA COSTA COUNTY

	Rates	Fringes
Sound & Communications		
Installer	$ 46.64	25.30
Technician	$ 53.64	25.51

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when

performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0332-001 06/01/2023

SANTA CLARA COUNTY

	Rates	Fringes
CABLE SPLICER	$ 95.65	44.42
ELECTRICIAN	$ 83.17	44.045

FOOTNOTES: Work under compressed air or where gas masks are required, orwork on ladders, scaffolds, stacks, ""Bosun's chairs,"" or other structures and where the workers are not protected by permanent guard rails at a distance of 40 to 60 ft. from the ground or supporting structures: to be paid one and one-half times the straight-time rate of pay. Work on structures of 60 ft. or over (as described above): to be paid twice the straight-time rate of pay.

ELEC0332-003 12/01/2022

SANTA CLARA COUNTY

	Rates	Fringes
Sound & Communications		
Installer	$ 51.18	25.435
Technician	$ 58.86	25.666

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside

electrician.

ELEC0595-001 06/01/2023

ALAMEDA COUNTY

	Rates	Fringes
CABLE SPLICER	$ 80.73	3%+42.87
ELECTRICIAN	$ 70.20	3%+42.87

ELEC0595-002 12/01/2022

CALAVERAS AND SAN JOAQUIN COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 53.34	7.75%+25.88
ELECTRICIAN		
(1) Tunnel work	$ 46.67	7.75%+25.88
(2) All other work	$ 44.45	7.75%+25.88

ELEC0595-006 12/01/2022

ALAMEDA COUNTY

	Rates	Fringes
Sound & Communications		
Installer	$ 51.18	3%+23.90
Technician	$ 58.86	3%+23.90

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0595-008 12/01/2022

CALAVERAS AND SAN JOAQUIN COUNTIES

	Rates	Fringes
Communications System		
Installer	$ 40.88	3%+23.90
Technician	$ 47.01	3%+23.90

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0617-001 06/01/2023

SAN MATEO COUNTY

	Rates	Fringes
ELECTRICIAN	$ 78.00	45.88

ELEC0617-003 11/01/2023

SAN MATEO COUNTY

	Rates	Fringes
Sound & Communications		
Installer	$ 51.18	26.10
Technician	$ 58.86	26.33

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0684-001 06/01/2023

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 46.00	3%+27.68

CABLE SPLICER = 110% of Journeyman Electrician

ELEC0684-004 12/01/2022

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES

	Rates	Fringes
Communications System		
Installer	$ 40.88	25.13
Technician	$ 47.01	25.31

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC1245-001 06/01/2022

	Rates	Fringes
LINE CONSTRUCTION		
(1) Lineman; Cable splicer	$ 64.40	22.58
(2) Equipment specialist (operates crawler tractors, commercial motor vehicles, backhoes, trenchers, cranes (50 tons and below), overhead & underground distribution line equipment)	$ 50.00	21.30
(3) Groundman	$ 38.23	20.89
(4) Powderman	$ 51.87	18.79

HOLIDAYS: New Year's Day, M.L. King Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day and day after Thanksgiving, Christmas Day

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ELEV0008-001 01/01/2023

	Rates	Fringes
ELEVATOR MECHANIC	$ 77.61	37.335+a+b

FOOTNOTE:
a. PAID VACATION: Employer contributes 8% of regular hourly rate as vacation pay credit for employees with more than 5 years of service, and 6% for 6 months to 5 years of service.
b. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

ENGI0003-001 06/28/2023

""AREA 1"" WAGE RATES ARE LISTED BELOW

""AREA 2"" RECEIVES AN ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES.

SEE AREA DEFINITIONS BELOW

	Rates	Fringes
OPERATOR: Power Equipment (AREA 1:)		
GROUP 1	$ 60.72	31.03
GROUP 2	$ 59.19	31.03
GROUP 3	$ 57.71	31.03
GROUP 4	$ 56.33	31.03
GROUP 5	$ 55.06	31.03
GROUP 6	$ 53.74	31.03
GROUP 7	$ 52.60	31.03
GROUP 8	$ 51.46	31.03
GROUP 8-A	$ 49.25	31.03
OPERATOR: Power Equipment (Cranes and Attachments - AREA 1:)		
GROUP 1		
Cranes	$ 52.30	31.15
Oiler	$ 43.79	31.15
Truck crane oiler	$ 46.08	31.15
GROUP 2		
Cranes	$ 50.54	31.15
Oiler	$ 42.83	31.15
Truck crane oiler	$ 45.07	31.15
GROUP 3		
Cranes	$ 48.80	31.15
Hydraulic	$ 44.44	31.15
Oiler	$ 42.55	31.15
Truck crane oiler	$ 44.83	31.15
GROUP 4		
Cranes	$ 45.76	31.15
OPERATOR: Power Equipment (Piledriving - AREA 1:)		
GROUP 1		
Lifting devices	$ 52.64	31.15
Oiler	$ 43.38	31.15
Truck Crane Oiler	$ 45.66	31.15
GROUP 2		
Lifting devices	$ 50.82	31.15
Oiler	$ 43.11	31.15

Truck Crane Oiler.....$ 45.41 31.15
GROUP 3
Lifting devices.....$ 49.14 31.15
Oiler.....$ 42.89 31.15
Truck Crane Oiler.....$ 45.12 31.15
GROUP 4
Lifting devices.....$ 47.37 31.15
GROUP 5
Lifting devices.....$ 44.73 31.15
GROUP 6
Lifting devices.....$ 42.50 31.15

OPERATOR: Power Equipment
(Steel Erection - AREA 1:)
GROUP 1
Cranes.....$ 53.27 31.15
Oiler.....$ 43.72 31.15
Truck Crane Oiler.....$ 45.95 31.15
GROUP 2
Cranes.....$ 51.50 31.15
Oiler.....$ 43.45 31.15
Truck Crane Oiler.....$ 45.73 31.15
GROUP 3
Cranes.....$ 50.02 31.15
Hydraulic.....$ 45.07 31.15
Oiler.....$ 43.23 31.15
Truck Crane Oiler.....$ 45.46 31.15
GROUP 4
Cranes.....$ 48.00 31.15
GROUP 5
Cranes.....$ 46.70 31.15

OPERATOR: Power Equipment
(Tunnel and Underground Work
- AREA 1:)
SHAFTS, STOPES, RAISES:
GROUP 1.....$ 56.82 31.03
GROUP 1-A.....$ 59.29 31.03
GROUP 2.....$ 55.56 31.03
GROUP 3.....$ 54.23 31.03
GROUP 4.....$ 53.09 31.03
GROUP 5.....$ 51.95 31.03
UNDERGROUND:
GROUP 1.....$ 56.72 31.03
GROUP 1-A.....$ 59.19 31.03
GROUP 2.....$ 55.46 31.03
GROUP 3.....$ 54.13 31.03
GROUP 4.....$ 52.99 31.03
GROUP 5.....$ 51.85 31.03

FOOTNOTE: Work suspended by ropes or cables, or work on a Yo-Yo Cat: $.60 per hour additional.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Operator of helicopter (when used in erection work); Hydraulic excavator, 7 cu. yds. and over; Power shovels, over 7 cu. yds.

GROUP 2: Highline cableway; Hydraulic excavator, 3-1/2 cu. yds. up to 7 cu. yds.; Licensed construction work boat operator, on site; Power blade operator (finish); Power shovels, over 1 cu. yd. up to and including 7 cu. yds. m.r.c.

GROUP 3: Asphalt milling machine; Cable backhoe; Combination

backhoe and loader over 3/4 cu. yds.; Continuous flight tie back machine assistant to engineer or mechanic; Crane mounted continuous flight tie back machine, tonnage to apply; Crane mounted drill attachment, tonnage to apply; Dozer, slope brd; Gradall; Hydraulic excavator, up to 3 1/2 cu. yds.; Loader 4 cu. yds. and over; Long reach excavator; Multiple engine scraper (when used as push pull); Power shovels, up to and including 1 cu. yd.; Pre-stress wire wrapping machine; Side boom cat, 572 or larger; Track loader 4 cu. yds. and over; Wheel excavator (up to and including 750 cu. yds. per hour)

GROUP 4: Asphalt plant engineer/box person; Chicago boom; Combination backhoe and loader up to and including 3/4 cu. yd.; Concrete batch plant (wet or dry); Dozer and/or push cat; Pull- type elevating loader; Gradesetter, grade checker (GPS, mechanical or otherwise); Grooving and grinding machine; Heading shield operator; Heavy-duty drilling equipment, Hughes, LDH, Watson 3000 or similar; Heavy-duty repairperson and/or welder; Lime spreader; Loader under 4 cu. yds.; Lubrication and service engineer (mobile and grease rack); Mechanical finishers or spreader machine (asphalt, Barber-Greene and similar); Miller Formless M-9000 slope paver or similar; Portable crushing and screening plants; Power blade support; Roller operator, asphalt; Rubber-tired scraper, self-loading (paddle-wheels, etc.); Rubber- tired earthmoving equipment (scrapers); Slip form paver (concrete); Small tractor with drag; Soil stabilizer (P & H or equal); Spider plow and spider puller; Tubex pile rig; Unlicensed constuction work boat operator, on site; Timber skidder; Track loader up to 4 yds.; Tractor-drawn scraper; Tractor, compressor drill combination; Welder; Woods-Mixer (and other similar Pugmill equipment)

GROUP 5: Cast-in-place pipe laying machine; Combination slusher and motor operator; Concrete conveyor or concrete pump, truck or equipment mounted; Concrete conveyor, building site; Concrete pump or pumpcrete gun; Drilling equipment, Watson 2000, Texoma 700 or similar; Drilling and boring machinery, horizontal (not to apply to waterliners, wagon drills or jackhammers); Concrete mixer/all; Person and/or material hoist; Mechanical finishers (concrete) (Clary, Johnson, Bidwell Bridge Deck or similar types); Mechanical burm, curb and/or curb and gutter machine, concrete or asphalt); Mine or shaft hoist; Portable crusher; Power jumbo operator (setting slip-forms, etc., in tunnels); Screed (automatic or manual); Self-propelled compactor with dozer; Tractor with boom D6 or smaller; Trenching machine, maximum digging capacity over 5 ft. depth; Vermeer T-600B rock cutter or similar

GROUP 6: Armor-Coater (or similar); Ballast jack tamper; Boom- type backfilling machine; Assistant plant engineer; Bridge and/or gantry crane; Chemical grouting machine, truck-mounted; Chip spreading machine operator; Concrete saw (self-propelled unit on streets, highways, airports and canals); Deck engineer; Drilling equipment Texoma 600, Hughes 200 Series or similar up to and including 30 ft. m.r.c.; Drill doctor; Helicopter radio operator; Hydro-hammer or similar; Line master; Skidsteer loader, Bobcat larger than 743 series or similar (with attachments); Locomotive; Lull hi-lift or similar; Oiler, truck mounted equipment; Pavement breaker, truck-mounted, with compressor combination; Paving fabric installation

and/or laying machine; Pipe bending machine (pipelines only); Pipe wrapping machine (tractor propelled and supported); Screed (except asphaltic concrete paving); Self- propelled pipeline wrapping machine; Tractor; Self-loading chipper; Concrete barrier moving machine

GROUP 7: Ballast regulator; Boom truck or dual-purpose A-frame truck, non-rotating - under 15 tons; Cary lift or similar; Combination slurry mixer and/or cleaner; Drilling equipment, 20 ft. and under m.r.c.; Firetender (hot plant); Grouting machine operator; Highline cableway signalperson; Stationary belt loader (Kolman or similar); Lift slab machine (Vagtborg and similar types); Maginnes internal full slab vibrator; Material hoist (1 drum); Mechanical trench shield; Pavement breaker with or without compressor combination); Pipe cleaning machine (tractor propelled and supported); Post driver; Roller (except asphalt); Chip Seal; Self-propelled automatically applied concrete curing mahcine (on streets, highways, airports and canals); Self-propelled compactor (without dozer); Signalperson; Slip-form pumps (lifting device for concrete forms); Tie spacer; Tower mobile; Trenching machine, maximum digging capacity up to and including 5 ft. depth; Truck- type loader

GROUP 8: Bit sharpener; Boiler tender; Box operator; Brakeperson; Combination mixer and compressor (shotcrete/gunite); Compressor operator; Deckhand; Fire tender; Forklift (under 20 ft.); Generator; Gunite/shotcrete equipment operator; Hydraulic monitor; Ken seal machine (or similar); Mixermobile; Oiler; Pump operator; Refrigeration plant; Reservoir-debris tug (self-propelled floating); Ross Carrier (construction site); Rotomist operator; Self-propelled tape machine; Shuttlecar; Self-propelled power sweeper operator (includes vacuum sweeper); Slusher operator; Surface heater; Switchperson; Tar pot firetender; Tugger hoist, single drum; Vacuum cooling plant; Welding machine (powered other than by electricity)

GROUP 8-A: Elevator operator; Skidsteer loader-Bobcat 743 series or smaller, and similar (without attachments); Mini excavator under 25 H.P. (backhoe-trencher); Tub grinder wood chipper

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ALL CRANES AND ATTACHMENTS

GROUP 1: Clamshell and dragline over 7 cu. yds.; Crane, over 100 tons; Derrick, over 100 tons; Derrick barge pedestal-mounted, over 100 tons; Self-propelled boom-type lifting device, over 100 tons

GROUP 2: Clamshell and dragline over 1 cu. yd. up to and including 7 cu. yds.; Crane, over 45 tons up to and including 100 tons; Derrick barge, 100 tons and under; Self-propelled boom-type lifting device, over 45 tons; Tower crane

GROUP 3: Clamshell and dragline up to and including 1 cu. yd.; Cranes 45 tons and under; Self-propelled boom-type lifting device 45 tons and under;

GROUP 4: Boom Truck or dual purpose A-frame truck, non-rotating over 15 tons; Truck-mounted rotating

telescopic boom type lifting device, Manitex or similar (boom truck) over 15 tons; Truck-mounted rotating telescopic boom type lifting device, Manitex or similar (boom truck) - under 15 tons;

PILEDRIVERS

GROUP 1: Derrick barge pedestal mounted over 100 tons; Clamshell over 7 cu. yds.; Self-propelled boom-type lifting device over 100 tons; Truck crane or crawler, land or barge mounted over 100 tons

GROUP 2: Derrick barge pedestal mounted 45 tons to and including 100 tons; Clamshell up to and including 7 cu. yds.; Self-propelled boom-type lifting device over 45 tons; Truck crane or crawler, land or barge mounted, over 45 tons up to and including 100 tons; Fundex F-12 hydraulic pile rig

GROUP 3: Derrick barge pedestal mounted under 45 tons; Self-propelled boom-type lifting device 45 tons and under; Skid/scow piledriver, any tonnage; Truck crane or crawler, land or barge mounted 45 tons and under

GROUP 4: Assistant operator in lieu of assistant to engineer; Forklift, 10 tons and over; Heavy-duty repairperson/welder

GROUP 5: Deck engineer

GROUP 6: Deckhand; Fire tender

STEEL ERECTORS

GROUP 1: Crane over 100 tons; Derrick over 100 tons; Self-propelled boom-type lifting device over 100 tons

GROUP 2: Crane over 45 tons to 100 tons; Derrick under 100 tons; Self-propelled boom-type lifting device over 45 tons to 100 tons; Tower crane

GROUP 3: Crane, 45 tons and under; Self-propelled boom-type lifting device, 45 tons and under

GROUP 4: Chicago boom; Forklift, 10 tons and over; Heavy-duty repair person/welder

GROUP 5: Boom cat

TUNNEL AND UNDERGROUND WORK

GROUP 1-A: Tunnel bore machine operator, 20' diameter or more

GROUP 1: Heading shield operator; Heavy-duty repairperson; Mucking machine (rubber tired, rail or track type); Raised bore operator (tunnels); Tunnel mole bore operator

GROUP 2: Combination slusher and motor operator; Concrete pump or pumpcrete gun; Power jumbo operator

GROUP 3: Drill doctor; Mine or shaft hoist

GROUP 4: Combination slurry mixer cleaner; Grouting Machine operator; Motorman

GROUP 5: Bit Sharpener; Brakeman; Combination mixer and compressor (gunite); Compressor operator; Oiler; Pump operator; Slusher operator

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AREA DESCRIPTIONS:

POWER EQUIPMENT OPERATORS, CRANES AND ATTACHMENTS,TUNNEL AND UNDERGROUND [These areas do not apply to Piledrivers and Steel Erectors]

AREA 1: ALAMEDA, CALAVERAS, CONTRA COSTA, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, STANISLAUS, TUOLUMNE

AREA 2 -NOTED BELOW

THE REMAINING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

CALAVERAS COUNTY:
Area 1: Remainder
Area 2: Eastern Part

FRESNO COUNTY:
Area 1: Remainder
Area 2: Eastern Part

MADERA COUNTY:
Area 1: Remainder
Area 2: Eastern Part

MARIPOSA COUNTY:
Area 1: Remainder
Area 2: Eastern Part

MONTEREY COUNTY:
Area 1: Remainder
Area 2: Southwestern part

TUOLUMNE COUNTY:
Area 1: Remainder
Area 2: Eastern Part

ENGI0003-008 08/01/2023

	Rates	Fringes
Dredging: (DREDGING: CLAMSHELL & DIPPER DREDGING; HYDRAULIC SUCTION DREDGING:)		
AREA 1:		
(1) Leverman	$ 57.95	37.55
(2) Dredge Dozer; Heavy duty repairman	$ 52.99	37.55
(3) Booster Pump Operator; Deck Engineer; Deck mate;		

Dredge Tender; Winch Operator	$ 51.87	37.55
(4) Bargeman; Deckhand; Fireman; Leveehand; Oiler	$ 48.57	37.55
AREA 2:		
(1) Leverman	$ 59.95	37.55
(2) Dredge Dozer; Heavy duty repairman	$ 54.99	37.55
(3) Booster Pump Operator; Deck Engineer; Deck mate; Dredge Tender; Winch Operator	$ 53.87	37.55
(4) Bargeman; Deckhand; Fireman; Leveehand; Oiler	$ 50.57	37.55

AREA DESCRIPTIONS

AREA 1: ALAMEDA,BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES

AREA 2: MODOC COUNTY

THE REMAINGING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

ALPINE COUNTY:
Area 1: Northernmost part
Area 2: Remainder

CALAVERAS COUNTY:
Area 1: Remainder
Area 2: Eastern part

COLUSA COUNTY:
Area 1: Eastern part
Area 2: Remainder

ELDORADO COUNTY:
Area 1: North Central part
Area 2: Remainder

FRESNO COUNTY:
Area 1: Remainder
Area 2: Eastern part

GLENN COUNTY:
Area 1: Eastern part
Area 2: Remainder

LASSEN COUNTY:
Area 1: Western part along the Southern portion of border with Shasta County
Area 2: Remainder

MADERA COUNTY:
Area 1: Except Eastern part
Area 2: Eastern part

MARIPOSA COUNTY
Area 1: Except Eastern part
Area 2: Eastern part

MONTERREY COUNTY
Area 1: Except Southwestern part
Area 2: Southwestern part

NEVADA COUNTY:
Area 1: All but the Northern portion along the border of Sierra County
Area 2: Remainder

PLACER COUNTY:
Area 1: Al but the Central portion
Area 2: Remainder

PLUMAS COUNTY:
Area 1: Western portion
Area 2: Remainder

SHASTA COUNTY:
Area 1: All but the Northeastern corner
Area 2: Remainder

SIERRA COUNTY:
Area 1: Western part
Area 2: Remainder

SISKIYOU COUNTY:
Area 1: Central part
Area 2: Remainder

SONOMA COUNTY:
Area 1: All but the Northwestern corner
Area 2: Remainder

TEHAMA COUNTY:
Area 1: All but the Western border with Mendocino & Trinity Counties
Area 2: Remainder

TRINITY COUNTY:
Area 1: East Central part and the Northeastern border with Shasta County
Area 2: Remainder

TUOLUMNE COUNTY:
Area 1: Except Eastern part
Area 2: Eastern part

ENGI0003-019 06/29/2020

SEE AREA DESCRIPTIONS BELOW

	Rates	Fringes
OPERATOR: Power Equipment (LANDSCAPE WORK ONLY)		
GROUP 1		
AREA 1	$ 39.95	30.28
AREA 2	$ 41.95	30.28
GROUP 2		
AREA 1	$ 36.35	30.28
AREA 2	$ 38.35	30.28
GROUP 3		
AREA 1	$ 31.74	30.28
AREA 2	$ 33.74	30.28

GROUP DESCRIPTIONS:

GROUP 1: Landscape Finish Grade Operator: All finish grade work regardless of equipment used, and all equipment with a rating more than 65 HP.

GROUP 2: Landscape Operator up to 65 HP: All equipment with a manufacturer's rating of 65 HP or less except equipment covered by Group 1 or Group 3. The following equipment shall be included except when used for finish work as long as manufacturer's rating is 65 HP or less: A-Frame and Winch Truck, Backhoe, Forklift, Hydragraphic Seeder Machine, Roller, Rubber-Tired and Track Earthmoving Equipment, Skiploader, Straw Blowers, and Trencher 31 HP up to 65 HP.

GROUP 3: Landscae Utility Operator: Small Rubber-Tired Tractor, Trencher Under 31 HP.

AREA DESCRIPTIONS:

AREA 1: ALAMEDA, BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES

AREA 2 - MODOC COUNTY

THE REMAINING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

ALPINE COUNTY:
Area 1: Northernmost part
Area 2: Remainder

CALAVERAS COUNTY:
Area 1: Except Eastern part
Area 2: Eastern part

COLUSA COUNTY:
Area 1: Eastern part
Area 2: Remainder

DEL NORTE COUNTY:
Area 1: Extreme Southwestern corner
Area 2: Remainder

ELDORADO COUNTY:
Area 1: North Central part
Area 2: Remainder

FRESNO COUNTY
Area 1: Except Eastern part
Area 2: Eastern part

GLENN COUNTY:
Area 1: Eastern part
Area 2: Remainder

HUMBOLDT COUNTY:
Area 1: Except Eastern and Southwestern parts
Area 2: Remainder

LAKE COUNTY:

Area 1: Southern part
Area 2: Remainder

LASSEN COUNTY:
Area 1: Western part along the Southern portion of border with Shasta County
Area 2: Remainder

MADERA COUNTY
Area 1: Remainder
Area 2: Eastern part

MARIPOSA COUNTY
Area 1: Remainder
Area 2: Eastern part

MENDOCINO COUNTY:
Area 1: Central and Southeastern parts
Area 2: Remainder

MONTEREY COUNTY
Area 1: Remainder
Area 2: Southwestern part

NEVADA COUNTY:
Area 1: All but the Northern portion along the border of Sierra County
Area 2: Remainder

PLACER COUNTY:
Area 1: All but the Central portion
Area 2: Remainder

PLUMAS COUNTY:
Area 1: Western portion
Area 2: Remainder

SHASTA COUNTY:
Area 1: All but the Northeastern corner
Area 2: Remainder

SIERRA COUNTY:
Area 1: Western part
Area 2: Remainder

SISKIYOU COUNTY:
Area 1: Central part
Area 2: Remainder

SONOMA COUNTY:
Area 1: All but the Northwestern corner
Area 2: Reaminder

TEHAMA COUNTY:
Area 1: All but the Western border with mendocino & Trinity Counties
Area 2: Remainder

TRINITY COUNTY:
Area 1: East Central part and the Northeaster border with Shasta County
Area 2: Remainder

TULARE COUNTY;
Area 1: Remainder

Area 2: Eastern part

TUOLUMNE COUNTY:
Area 1: Remainder
Area 2: Eastern Part

IRON0377-001 01/01/2023

ALAMEDA, CONTRA COSTA, SAN MATEO, SANTA CLARA COUNTIES

	Rates	Fringes
Ironworkers:		
Fence Erector	$ 41.28	25.66
Ornamental, Reinforcing and Structural	$ 49.88	34.30

PREMIUM PAY:

$6.00 additional per hour at the following locations:

China Lake Naval Test Station, Chocolate Mountains Naval Reserve-Niland,
Edwards AFB, Fort Irwin Military Station, Fort Irwin Training Center-Goldstone, San Clemente Island, San Nicholas Island, Susanville Federal Prison, 29 Palms - Marine Corps, U.S. Marine Base - Barstow, U.S. Naval Air Facility - Sealey, Vandenberg AFB

$4.00 additional per hour at the following locations:

Army Defense Language Institute - Monterey, Fallon Air Base, Naval Post Graduate School - Monterey, Yermo Marine Corps Logistics Center

$2.00 additional per hour at the following locations:

Port Hueneme, Port Mugu, U.S. Coast Guard Station - Two Rock

IRON0377-003 01/01/2023

SAN FRANCISCO CITY and COUNTY

	Rates	Fringes
Ironworkers:		
Fence Erector	$ 41.28	25.66
Ornamental, Reinforcing and Structural	$ 50.38	34.30

PREMIUM PAY:

$6.00 additional per hour at the following locations:

China Lake Naval Test Station, Chocolate Mountains Naval Reserve-Niland,
Edwards AFB, Fort Irwin Military Station, Fort Irwin Training Center-Goldstone, San Clemente Island, San Nicholas Island, Susanville Federal Prison, 29 Palms - Marine Corps, U.S. Marine Base - Barstow, U.S. Naval Air Facility - Sealey, Vandenberg AFB

$4.00 additional per hour at the following locations:

Army Defense Language Institute - Monterey, Fallon Air Base, Naval Post Graduate School - Monterey, Yermo Marine Corps Logistics Center

$2.00 additional per hour at the following locations:

Port Hueneme, Port Mugu, U.S. Coast Guard Station - Two Rock

IRON0433-005 01/01/2023

REMAINING COUNTIES

	Rates	Fringes
IRONWORKER		
Fence Erector	$ 41.28	25.66
Ornamental, Reinforcing and Structural	$ 46.20	34.30

PREMIUM PAY:

$6.00 additional per hour at the following locations:

China Lake Naval Test Station, Chocolate Mountains Naval Reserve-Niland, Edwards AFB, Fort Irwin Military Station, Fort Irwin Training Center-Goldstone, San Clemente Island, San Nicholas Island, Susanville Federal Prison, 29 Palms - Marine Corps, U.S. Marine Base - Barstow, U.S. Naval Air Facility - Sealey, Vandenberg AFB

$4.00 additional per hour at the following locations:

Army Defense Language Institute - Monterey, Fallon Air Base, Naval Post Graduate School - Monterey, Yermo Marine Corps Logistics Center

$2.00 additional per hour at the following locations:

Port Hueneme, Port Mugu, U.S. Coast Guard Station - Two Rock

LABO0067-006 06/26/2023

AREA ""1"" - ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO AND SANTA CLARA COUNTIES

AREA ""2"" - CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, STANISLAUS, AND TUOLUMNE COUNTIES

	Rates	Fringes
LABORER (ASBESTOS/MOLD/LEAD LABORER)		
Area 1	$ 36.50	28.34
Area 2	$ 35.50	28.34

ASBESTOS REMOVAL-SCOPE OF WORK: Site mobilization; initial site clean-up; site preparation; removal of asbestos-containing materials from walls and ceilings; or from pipes, boilers and mechanical systems only if they are

being scrapped; encapsulation, enclosure and disposal of asbestos-containing materials by hand or with equipment or machinery; scaffolding; fabrication of temporary wooden barriers; and assembly of decontamination stations.

LABO0073-002 07/01/2023

CALAVERAS AND SAN JOAQUIN COUNTIES

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE)		
Escort Driver, Flag Person	$ 36.26	27.30
Traffic Control Person I	$ 36.56	27.30
Traffic Control Person II	$ 34.06	27.30

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0073-003 07/01/2023

SAN JOAQUIN COUNTY

	Rates	Fringes
LABORER		
Mason Tender-Brick	$ 36.29	25.55

LABO0073-005 06/26/2023

	Rates	Fringes
Tunnel and Shaft Laborers:		
GROUP 1	$ 45.89	27.72
GROUP 2	$ 45.66	27.72
GROUP 3	$ 45.41	27.72
GROUP 4	$ 44.96	27.72
GROUP 5	$ 44.42	27.72
Shotcrete Specialist	$ 46.41	27.72

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work);

Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO0073-007 06/26/2023

CALAVERAS AND SAN JOAQUIN COUNTIES

	Rates	Fringes
LABORER (CONSTRUCTION CRAFT LABORERS)		
Construction Specialist Group	$ 36.20	27.30
GROUP 1	$ 35.50	27.30
GROUP 1-a	$ 35.72	27.30
GROUP 1-c	$ 35.55	27.30
GROUP 1-e	$ 36.05	27.30
GROUP 1-f	$ 30.37	23.20
GROUP 2	$ 35.35	27.30
GROUP 3	$ 35.25	27.30
GROUP 4	$ 28.94	27.30
See groups 1-b and 1-d under laborer classifications.		
LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS)		
(1) New Construction	$ 35.25	27.30
(2) Establishment Warranty Period	$ 28.94	27.30
LABORER (GUNITE)		
GROUP 1	$ 36.46	27.30
GROUP 2	$ 35.96	27.30
GROUP 3	$ 35.37	27.30
GROUP 4	$ 35.25	27.30
LABORER (WRECKING)		
GROUP 1	$ 35.50	27.30
GROUP 2	$ 35.35	27.30

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified

hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2"" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive $4.00 per day above Group 1 wage rates. ""Sewer cleaner"" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive $5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive $ .25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the

depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification ""material cleaner"" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of ""form stripping, cleaning and oiling and moving to the next point of erection"".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

LABO0073-009 07/01/2023

CALAVERAS AND SAN JOAQUIN COUNTIES

	Rates	Fringes
LABORER (Plaster Tender)	$ 39.77	28.54

Work on a swing stage scaffold: $1.00 per hour additional.

LABO0261-003 07/01/2023

SAN FRANCISCO AND SAN MATEO COUNTIES

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE)		
Escort Driver, Flag Person	$ 37.26	27.30
Traffic Control Person I	$ 37.56	27.30
Traffic Control Person II	$ 35.06	27.30

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0261-005 06/26/2023

SAN FRANCISCO AND SAN MATEO COUNTIES

	Rates	Fringes
Tunnel and Shaft Laborers:		
GROUP 1	$ 45.89	27.72
GROUP 2	$ 45.66	27.72
GROUP 3	$ 45.41	27.72
GROUP 4	$ 44.96	27.72
GROUP 5	$ 44.42	27.72
Shotcrete Specialist	$ 46.41	27.72

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and

setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO0261-009 06/26/2023

SAN FRANCISCO, AND SAN MATEO COUNTIES

	Rates	Fringes
LABORER (CONSTRUCTION CRAFT LABORERS - AREA A:)		
Construction Specialist Group	$ 37.20	27.30
GROUP 1	$ 36.50	27.30
GROUP 1-a	$ 36.72	27.30
GROUP 1-c	$ 36.55	27.30
GROUP 1-e	$ 37.05	27.30
GROUP 1-f	$ 31.37	23.20
GROUP 2	$ 36.35	27.30
GROUP 3	$ 36.25	27.30
GROUP 4	$ 29.94	27.30
See groups 1-b and 1-d under laborer classifications.		
LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS - AREA A:)		
(1) New Construction	$ 36.25	27.30
(2) Establishment Warranty Period	$ 29.94	27.30
LABORER (WRECKING - AREA A:)		
GROUP 1	$ 36.50	27.30
GROUP 2	$ 36.35	27.30
Laborers: (GUNITE - AREA A:)		
GROUP 1	$ 37.46	27.30
GROUP 2	$ 36.96	27.30
GROUP 3	$ 36.37	27.30
GROUP 4	$ 36.25	27.30

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker

and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2"" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive $4.00 per day above Group 1 wage rates. ""Sewer cleaner"" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive $5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive $ .25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts

thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification ""material cleaner"" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of ""form stripping, cleaning and oiling and moving to the next point of erection"".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

LABO0261-011 07/01/2023

SAN FRANCISCO AND SAN MATEO COUNTIES:

	Rates	Fringes
MASON TENDER, BRICK	$ 37.05	27.45

FOOTNOTES: Underground work such as sewers, manholes, catch basins, sewer pipes, telephone conduits, tunnels and cut trenches: $5.00 per day additional. Work in live sewage: $2.50 per day additional.

LABO0261-014 07/01/2023

SAN FRANCISCO AND SAN MATEO COUNTIES:

	Rates	Fringes
PLASTER TENDER	$ 41.93	30.32

Work on a swing stage scaffold: $1.00 per hour additional.

LABO0270-003 07/01/2023

AREA A: SANTA CLARA

AREA B: MONTEREY, SAN BENITO AND SANTA CRUZ COUNTIES

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE)		
Escort Driver, Flag Person		
Area A	$ 37.26	27.30
Area B	$ 36.26	27.30
Traffic Control Person I		
Area A	$ 37.56	27.30
Area B	$ 36.56	27.30
Traffic Control Person II		
Area A	$ 35.06	27.30
Area B	$ 34.06	27.30

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0270-004 06/26/2023

MONTEREY, SAN BENITO, SANTA CLARA, AND SANTA CRUZ COUNTIES

	Rates	Fringes

Tunnel and Shaft Laborers:

GROUP 1	$ 45.89	27.72
GROUP 2	$ 45.66	27.72
GROUP 3	$ 45.41	27.72
GROUP 4	$ 44.96	27.72
GROUP 5	$ 44.42	27.72
Shotcrete Specialist	$ 46.41	27.72

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO0270-005 07/01/2023

MONTEREY AND SAN BENITO COUNTIES

	Rates	Fringes
LABORER		
Mason Tender-Brick	$ 36.29	25.55

LABO0270-007 06/26/2023

MONTEREY, SAN BENITO AND SANTA CRUZ COUNTIES

	Rates	Fringes
LABORER (CONSTRUCTION CRAFT LABORERS - AREA B)		
Construction Specialist Group	$ 36.20	27.30
GROUP 1	$ 35.50	27.30
GROUP 1-a	$ 35.72	27.30
GROUP 1-c	$ 35.55	27.30
GROUP 1-e	$ 36.05	27.30
GROUP 1-f	$ 36.08	27.30
GROUP 2	$ 35.35	27.30
GROUP 3	$ 35.25	27.30
GROUP 4	$ 28.94	27.30

See groups 1-b and 1-d under laborer classifications.

LABORER (GARDENERS,

HORTICULTURAL & LANDSCAPE
LABORERS - AREA B)

(1) New Construction	$ 35.25	27.30
(2) Establishment Warranty Period	$ 28.94	27.30

LABORER (GUNITE - AREA B)

GROUP 1	$ 36.46	27.30
GROUP 2	$ 35.96	27.30
GROUP 3	$ 35.37	27.30
GROUP 4	$ 35.25	27.30

LABORER (WRECKING - AREA B)

GROUP 1	$ 35.50	27.30
GROUP 2	$ 35.35	27.30

FOOTNOTES:
Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2"" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work;

Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive $4.00 per day above Group 1 wage rates. ""Sewer cleaner"" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive $5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive $ .25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction

track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification ""material cleaner"" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of ""form stripping, cleaning and oiling and moving to the next point of erection"".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

LABO0270-010 06/26/2023

SANTA CLARA COUNTY

	Rates	Fringes
LABORER (CONSTRUCTION CRAFT LABORERS - AREA A:)		
Construction Specialist Group	$ 37.20	27.30
GROUP 1	$ 36.50	27.30
GROUP 1-a	$ 36.72	27.30
GROUP 1-c	$ 36.55	27.30
GROUP 1-e	$ 37.05	27.30
GROUP 1-f	$ 37.08	27.30
GROUP 2	$ 36.35	27.30
GROUP 3	$ 36.25	27.30
GROUP 4	$ 29.94	27.30
See groups 1-b and 1-d under laborer classifications.		
LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS - AREA A:)		
(1) New Construction	$ 36.25	27.30
(2) Establishment Warranty		

Period	$ 29.94	27.30
LABORER (GUNITE - AREA A:)		
GROUP 1	$ 37.46	27.30
GROUP 2	$ 36.96	27.30
GROUP 3	$ 36.37	27.30
GROUP 4	$ 36.25	27.30
LABORER (WRECKING - AREA A:)		
GROUP 1	$ 36.50	27.30
GROUP 2	$ 36.35	27.30

FOOTNOTES:
Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2"" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143

and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive $4.00 per day above Group 1 wage rates. ""Sewer cleaner"" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive $5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive $ .25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building

including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification ""material cleaner"" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of ""form stripping, cleaning and oiling and moving to the next point of erection"".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

LABO0270-011 07/01/2023

MONTEREY, SAN BENITO, SANTA CRUZ, SANTA CLARA COUNTIES

	Rates	Fringes
LABORER (Plaster Tender)	$ 40.68	29.68

Work on a swing stage scaffold: $1.00 per hour additional.

LABO0294-001 07/01/2023

FRESNO, KINGS AND MADERA COUNTIES

	Rates	Fringes
LABORER (Brick)		
Mason Tender-Brick	$ 36.29	25.55

LABO0294-002 07/01/2023

FRESNO, KINGS, AND MADERA COUNTIES

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE)		
Escort Driver, Flag Person	$ 36.26	27.30

Traffic Control Person I	$ 36.56	27.30
Traffic Control Person II	$ 34.06	27.30

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0294-005 06/26/2023

FRESNO, KINGS, AND MADERA COUNTIES

	Rates	Fringes
Tunnel and Shaft Laborers:		
GROUP 1	$ 45.89	27.72
GROUP 2	$ 45.66	27.72
GROUP 3	$ 45.41	27.72
GROUP 4	$ 44.96	27.72
GROUP 5	$ 44.42	27.72
Shotcrete Specialist	$ 46.41	27.72

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO0294-008 06/26/2023

FRESNO, KINGS, AND MADERA COUNTIES

	Rates	Fringes
LABORER (CONSTRUCTION CRAFT LABORERS - AREA B:)		
Construction Specialist Group	$ 36.20	27.30
GROUP 1	$ 35.50	27.30
GROUP 1-a	$ 35.72	27.30
GROUP 1-c	$ 35.55	27.30

GROUP 1-e.....$ 36.05 27.30
GROUP 1-f.....$ 36.08 27.30
GROUP 2.....$ 35.35 27.30
GROUP 3.....$ 35.25 27.30
GROUP 4.....$ 28.94 27.30

See groups 1-b and 1-d under laborer classifications.

LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS - AREA B:)
(1) New Construction.....$ 35.25 27.30
(2) Establishment Warranty Period.....$ 28.94 27.30

LABORER (GUNITE - AREA B:)
GROUP 1.....$ 36.46 27.30
GROUP 2.....$ 35.96 27.30
GROUP 3.....$ 35.37 27.30
GROUP 4.....$ 35.25 27.30

LABORER (WRECKING - AREA B:)
GROUP 1.....$ 35.50 27.30
GROUP 2.....$ 35.35 27.30

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2"" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun;

Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive $4.00 per day above Group 1 wage rates. ""Sewer cleaner"" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive $5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive $ .25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification ""material cleaner"" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of ""form stripping, cleaning and oiling and moving to the next point of erection"".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

LABO0294-010 07/01/2023

CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS & TUOLUMNE

	Rates	Fringes
Plasterer tender	$ 39.77	28.54

Work on a swing stage scaffold: $1.00 per hour additional.

LABO0294-011 07/01/2023

FRESNO, KINGS, AND MADERA COUNTIES

	Rates	Fringes

LABORER (Plaster Tender).....$ 39.77 28.54

Work on a swing stage scaffold: $1.00 per hour additional.

LABO0304-002 07/01/2023

ALAMEDA COUNTY

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE)		
Escort Driver, Flag Person	$ 37.26	27.30
Traffic Control Person I	$ 37.56	27.30
Traffic Control Person II	$ 35.06	27.30

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0304-003 06/26/2023

ALAMEDA COUNTY

	Rates	Fringes
Tunnel and Shaft Laborers:		
GROUP 1	$ 45.89	27.72
GROUP 2	$ 45.66	27.72
GROUP 3	$ 45.41	27.72
GROUP 4	$ 44.96	27.72
GROUP 5	$ 44.42	27.72
Shotcrete Specialist	$ 46.41	27.72

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO0304-004 06/26/2023

ALAMEDA COUNTY

	Rates	Fringes
LABORER (CONSTRUCTION CRAFT LABORERS - AREA A:)		
Construction Specialist Group	$ 37.20	27.30
GROUP 1	$ 36.50	27.30
GROUP 1-a	$ 36.72	27.30
GROUP 1-c	$ 36.55	27.30
GROUP 1-e	$ 37.05	27.30
GROUP 1-f	$ 37.08	27.30
GROUP 2	$ 36.35	27.30
GROUP 3	$ 36.25	27.30
GROUP 4	$ 29.94	27.30
See groups 1-b and 1-d under laborer classifications.		
LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS - AREA A:)		
(1) New Construction	$ 36.25	27.30
(2) Establishment Warranty Period	$ 29.94	27.30
LABORER (GUNITE - AREA A:)		
GROUP 1	$ 37.46	27.30
GROUP 2	$ 36.96	27.30
GROUP 3	$ 36.37	27.30
GROUP 4	$ 36.25	27.30
LABORER (WRECKING - AREA A:)		
GROUP 1	$ 36.50	27.30
GROUP 2	$ 36.35	27.30

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2"" or over, 100 lbs. pressure/over); Hydro seeder and similar

type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive $4.00 per day above Group 1 wage rates. ""Sewer cleaner"" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive $5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive $ .25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification ""material cleaner"" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of ""form stripping, cleaning and oiling and moving to the next point of erection"".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

LABO0304-005 07/01/2023

ALAMEDA COUNTY

	Rates	Fringes
Brick Tender	$ 37.05	27.45

FOOTNOTES: Work on jobs where heat-protective clothing is required: $2.00 per hour additional. Work at grinders: $.25 per hour additional. Manhole work: $2.00 per day additional.

LABO0304-008 07/01/2023

ALAMEDA AND CONTRA COSTA COUNTIES:

	Rates	Fringes
Plasterer tender	$ 41.93	30.32

Work on a swing stage scaffold: $1.00 per hour additional.

LABO0324-002 07/01/2023

CONTRA COSTA COUNTY

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE)		
Escort Driver, Flag Person	$ 37.26	27.30
Traffic Control Person I	$ 37.56	27.30
Traffic Control Person II	$ 35.06	27.30

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0324-006 06/26/2023

CONTRA COSTA COUNTY

	Rates	Fringes
Tunnel and Shaft Laborers:		
GROUP 1	$ 45.89	27.72
GROUP 2	$ 45.66	27.72
GROUP 3	$ 45.41	27.72
GROUP 4	$ 44.96	27.72
GROUP 5	$ 44.42	27.72
Shotcrete Specialist	$ 46.41	27.72

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman;

Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO0324-012 06/26/2023

CONTRA COSTA COUNTY

	Rates	Fringes
LABORER (CONSTRUCTION CRAFT LABORERS - AREA A:)		
Construction Specialist Group	$ 37.20	27.30
GROUP 1	$ 36.50	27.30
GROUP 1-a	$ 36.72	27.30
GROUP 1-c	$ 36.55	27.30
GROUP 1-e	$ 37.05	27.30
GROUP 1-f	$ 37.08	27.30
GROUP 1-g	$ 36.70	27.30
GROUP 2	$ 36.35	27.30
GROUP 3	$ 36.25	27.30
GROUP 4	$ 29.94	27.30
See groups 1-b and 1-d under laborer classifications.		
LABORER (GARDENERS, HORTICULURAL & LANDSCAPE LABORERS - AREA A:)		
(1) New Construction	$ 36.25	27.30
(2) Establishment Warranty Period	$ 29.94	27.30
LABORER (GUNITE - AREA A:)		
GROUP 1	$ 37.46	27.30
GROUP 2	$ 36.96	27.30
GROUP 3	$ 36.37	27.30
GROUP 4	$ 36.25	27.30
LABORER (WRECKING - AREA A:)		
GROUP 1	$ 36.50	27.30
GROUP 2	$ 36.35	27.30

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work;

Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2"" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive $4.00 per day above Group 1 wage rates. ""Sewer cleaner"" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive $5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive $ .25 per hour above their regular rate for all work performed on underground structures not specifically

covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 1-g, CONTRA COSTA COUNTY: Pipelayer (including grade checking in connection with pipelaying); Caulker; Bander; Pipewrapper; Conduit layer; Plastic pipe layer; Pressure pipe tester; No joint pipe and stripping of same, including repair of voids; Precast manhole setters, cast in place manhole form setters

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification ""material cleaner"" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of ""form stripping, cleaning and oiling and moving to the next point of erection"".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

GROUP 1-g, CONTRA COSTA COUNTY: Pipelayer (including grade checking in connection with pipelaying); Caulker; Bander; Pipewrapper; Conduit layer; Plastic pipe layer; Pressure pipe tester; No joint pipe and stripping of same, including repair of voids; Precast manhole setters, cast in place manhole form setters

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LABO0324-014 07/01/2023

CONTRA COSTA COUNTY:

	Rates	Fringes
Brick Tender	$ 37.05	27.45

FOOTNOTES: Work on jobs where heat-protective clothing is required: $2.00 per hour additional. Work at grinders: $.25 per hour additional. Manhole work: $2.00 per day additional.

LABO0324-018 07/01/2023

ALAMEDA AND CONTRA COSTA COUNTIES:

	Rates	Fringes
Plasterer tender	$ 41.93	30.32

Work on a swing stage scaffold: $1.00 per hour additional.

LABO1130-002 07/01/2023

MARIPOSA, MERCED, STANISLAUS, AND TUOLUMNE COUNTIES

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE)		
Escort Driver, Flag Person	$ 36.26	27.30
Traffic Control Person I	$ 36.56	27.30
Traffic Control Person II	$ 34.06	27.30

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO1130-003 06/26/2023

MARIPOSA, MERCED, STANISLAUS, AND TUOLUMNE COUNTIES

	Rates	Fringes
Tunnel and Shaft Laborers:		
GROUP 1	$ 45.89	27.72
GROUP 2	$ 45.66	27.72
GROUP 3	$ 45.41	27.72
GROUP 4	$ 44.96	27.72
GROUP 5	$ 44.42	27.72
Shotcrete Specialist	$ 46.41	27.72

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO1130-005 07/01/2023

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES

	Rates	Fringes
LABORER		
Mason Tender-Brick	$ 36.29	25.55

LABO1130-007 06/26/2023

MARIPOSA, MERCED, STANISLAUS, AND TUOLUMNE , COUNTIES

	Rates	Fringes
LABORER (CONSTRUCTION CRAFT LABORERS - AREA B:)		
Construction Specialist		

Group.....$ 36.20 27.30
GROUP 1.....$ 35.50 27.30
GROUP 1-a.....$ 35.72 27.30
GROUP 1-c.....$ 35.55 27.30
GROUP 1-e.....$ 36.05 27.30
GROUP 1-f.....$ 36.08 27.30
GROUP 2.....$ 35.35 27.30
GROUP 3.....$ 35.25 27.30
GROUP 4.....$ 28.94 27.30

See groups 1-b and 1-d under laborer classifications.

LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS - AREA B:)
(1) New Construction.....$ 35.25 27.30
(2) Establishment Warranty Period.....$ 28.94 27.30

LABORER (GUNITE - AREA B:)
GROUP 1.....$ 36.46 27.30
GROUP 2.....$ 35.96 27.30
GROUP 3.....$ 35.37 27.30
GROUP 4.....$ 35.25 27.30

LABORER (WRECKING - AREA B:)
GROUP 1.....$ 35.50 27.30
GROUP 2.....$ 35.35 27.30

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2"" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in

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GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush

shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

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GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

LABO1130-008 07/01/2023

CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS & TUOLUMNE

	Rates	Fringes
Plasterer tender	$ 39.77	28.54

Work on a swing stage scaffold: $1.00 per hour additional.

LABO1130-009 07/01/2023

MARIPOSA, MERCED, STANISLAUS, AND TUOLUMNE COUNTIES

	Rates	Fringes
LABORER (Plaster Tender).....	$ 39.77	28.54

Work on a swing stage scaffold: $1.00 per hour additional.

PAIN0016-001 01/01/2023

ALAMEDA, CONTRA COSTA, MONTEREY, SAN BENITO, SAN MATEO, SANTA CLARA, AND SANTA CRUZ COUNTIES

	Rates	Fringes
Painters:.....	$ 47.42	27.28

PREMIUMS:

EXOTIC MATERIALS - $1.25 additional per hour.
SPRAY WORK: - $0.50 additional per hour.
INDUSTRIAL PAINTING - $0.25 additional per hour
  [Work on industrial buildings used for the manufacture and processing of goods for sale or service; steel construction (bridges), stacks, towers, tanks, and similar structures]

HIGH WORK:
over 50 feet - $2.00 per hour additional
100 to 180 feet - $4.00 per hour additional
Over 180 feet - $6.00 per houir additional

PAIN0016-003 07/01/2023

AREA 1: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO & SANTA CLARA COUNTIES

AREA 2: CALAVERAS, MARIPOA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, STANISLAUS & TUOLUMNE COUNTIES

	Rates	Fringes
Drywall Finisher/Taper		
AREA 1.....	$ 60.41	31.34
AREA 2.....	$ 56.28	29.94

PAIN0016-012 01/01/2023

ALAMEDA, CONTRA COSTA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA AND SANTA CRUZ COUNTIES

	Rates	Fringes
SOFT FLOOR LAYER.....	$ 55.25	32.63

PAIN0016-015 01/01/2023

CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS & TUOLUMNE COUNTIES

	Rates	Fringes
PAINTER		
Brush	$ 38.23	22.05

FOOTNOTES:
SPRAY/SANDBLAST: $0.50 additional per hour.
EXOTIC MATERIALS: $1.25 additional per hour.
HIGH TIME: Over 50 ft above ground or water level $2.00 additional per hour. 100 to 180 ft above ground or water level $4.00 additional per hour. Over 180 ft above ground or water level $6.00 additional per hour.

PAIN0016-022 01/01/2023

SAN FRANCISCO COUNTY

	Rates	Fringes
PAINTER	$ 51.04	27.28

PAIN0169-001 01/01/2023

FRESNO, KINGS, MADERA, MARIPOSA AND MERCED COUNTIES:

	Rates	Fringes
GLAZIER	$ 44.33	28.88

PAIN0169-005 01/01/2023

ALAMEDA CONTRA COSTA, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA & SANTA CRUZ COUNTIES

	Rates	Fringes
GLAZIER	$ 55.77	32.45

PAIN0294-004 07/01/2023

FRESNO, KINGS AND MADERA COUNTIES

	Rates	Fringes
PAINTER		
Brush, Roller	$ 34.49	21.80
Drywall Finisher/Taper	$ 35.74	21.80

FOOTNOTE:
Spray Painters & Paperhangers recive $1.00 additional per hour. Painters doing Drywall Patching receive $1.25 additional per hour. Lead Abaters & Sandblasters receive $1.50 additional per hour. High Time - over 30 feet (does not include work from a lift) $0.75 per hour additional.

PAIN0294-005 01/01/2023

FRESNO, KINGS & MADERA

	Rates	Fringes
SOFT FLOOR LAYER	$ 38.53	23.19

PAIN0767-001 01/01/2023

CALAVERAS, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
GLAZIER	$ 43.15	33.72

PAID HOLIDAYS: New Year's Day, Martin Luther King, Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.

Employee required to wear a body harness shall receive $1.50 per hour above the basic hourly rate at any elevation.

PAIN1176-001 07/01/2022

HIGHWAY IMPR0VEMENT

	Rates	Fringes
Parking Lot Striping/Highway Marking:		
GROUP 1	$ 40.83	17.62
GROUP 2	$ 34.71	17.62
GROUP 3	$ 35.11	17.62

CLASSIFICATIONS

GROUP 1: Striper: Layout and application of painted traffic stripes and marking; hot thermo plastic; tape, traffic stripes and markings

GROUP 2: Gamecourt & Playground Installer

GROUP 3: Protective Coating, Pavement Sealing

PAIN1237-003 01/01/2023

CALAVERAS; SAN JOAQUIN COUNTIES; STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
SOFT FLOOR LAYER	$ 46.24	25.96

PLAS0066-002 07/01/2019

ALAMEDA, CONTRA COSTA, SAN MATEO AND SAN FRANCISCO COUNTIES:

	Rates	Fringes
PLASTERER	$ 42.41	30.73

PLAS0300-001 07/01/2018

	Rates	Fringes
PLASTERER		
AREA 188: Fresno	$ 32.70	31.68
AREA 224: San Benito,		

Santa Clara, Santa Cruz.....$ 32.88 31.68
AREA 295: Calaveras & San
Joaquin Couonties.....$ 32.70 31.68
AREA 337: Monterey County..$ 32.88 31.68
AREA 429: Mariposa,
Merced, Stanislaus,
Tuolumne Counties.....$ 32.70 31.68

PLAS0300-005 07/01/2016

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	$ 32.15	23.27

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* PLUM0038-001 07/01/2023

SAN FRANCISCO COUNTY

	Rates	Fringes
PLUMBER (Plumber, Steamfitter, Refrigeration Fitter).....	$ 85.50	48.98

PLUM0038-005 07/01/2022

SAN FRANCISCO COUNTY

	Rates	Fringes
Landscape/Irrigation Fitter (Underground/Utility Fitter).....	$ 69.70	33.15

PLUM0062-001 07/01/2023

MONTEREY AND SANTA CRUZ COUNTIES

	Rates	Fringes
PLUMBER & STEAMFITTER.....	$ 51.00	40.10

PLUM0159-001 07/01/2023

CONTRA COSTA COUNTY

	Rates	Fringes
Plumber and steamfitter		
(1) Refrigeration.....	$ 63.33	46.64
(2) All other work.....	$ 62.12	45.24

PLUM0246-001 01/01/2023

FRESNO, KINGS & MADERA COUNTIES

	Rates	Fringes
PLUMBER & STEAMFITTER.....	$ 46.95	38.59

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* PLUM0246-004 01/01/2017

FRESNO, MERCED & SAN JOAQUIN COUNIES

	Rates	Fringes

PLUMBER (PIPE TRADESMAN).....$ 13.00 ** 10.74

PIPE TRADESMAN SCOPE OF WORK:
Installation of corrugated metal piping for drainage, as well as installation of corrugated metal piping for culverts in connection with storm sewers and drains; Grouting, dry packing and diapering of joints, holes or chases including paving over joints, in piping; Temporary piping for dirt work for building site preparation; Operating jack hammers, pavement breakers, chipping guns, concrete saws and spades to cut holes, chases and channels for piping systems; Digging, grading, backfilling and ground preparation for all types of pipe to all points of the jobsite; Ground preparation including ground leveling, layout and planting of shrubbery, trees and ground cover, including watering, mowing, edging, pruning and fertilizing, the breaking of concrete, digging, backfilling and tamping for the preparation and completion of all work in connection with lawn sprinkler and landscaping; Loading, unloading and distributing materials at jobsite; Putting away materials in storage bins in jobsite secure storage area; Demolition of piping and fixtures for remodeling and additions; Setting up and tearing down work benches, ladders and job shacks; Clean-up and sweeping of jobsite; Pipe wrapping and waterproofing where tar or similar material is applied for protection of buried piping; Flagman

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PLUM0342-001 07/01/2023

ALAMEDA & CONTRA COSTA COUNTIES

	Rates	Fringes
PIPEFITTER		
CONTRA COSTA COUNTY	$ 74.00	47.45
PLUMBER, PIPEFITTER, STEAMFITTER		
ALAMEDA COUNTY	$ 74.00	47.45

PLUM0355-004 07/01/2022

ALAMEDA, CALAVERAS, CONTRA COSTA, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, STANISLAUS, AND TUOLUMNE COUNTIES:

	Rates	Fringes
Underground Utility Worker /Landscape Fitter	$ 32.22	17.55

PLUM0393-001 07/01/2021

SAN BENITO AND SANTA CLARA COUNTIES

	Rates	Fringes
PLUMBER/PIPEFITTER	$ 68.76	46.63

PLUM0442-001 07/01/2023

CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS & TUOLUMNE COUNTIES

	Rates	Fringes
PLUMBER & STEAMFITTER.....	$ 51.90	35.64

PLUM0467-001 07/01/2021

SAN MATEO COUNTY

	Rates	Fringes
Plumber/Pipefitter/Steamfitter...	$ 73.10	38.61

ROOF0027-002 01/01/2023

FRESNO, KINGS, AND MADERA COUNTIES

	Rates	Fringes
ROOFER.....	$ 41.31	15.31

FOOTNOTE: Work with pitch, pitch base of pitch impregnated products or any material containing coal tar pitch, on any building old or new, where both asphalt and pitchers are used in the application of a built-up roof or tear off: $2.00 per hour additional.

ROOF0040-002 08/01/2023

SAN FRANCISCO & SAN MATEO COUNTIES:

	Rates	Fringes
ROOFER.....	$ 52.43	22.19

ROOF0081-001 08/01/2023

ALAMEDA AND CONTRA COSTA COUNTIES:

	Rates	Fringes
Roofer.....	$ 52.47	22.31

ROOF0081-004 08/01/2023

CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
ROOFER.....	$ 46.73	21.36

ROOF0095-002 08/01/2023

MONTEREY, SAN BENITO, SANTA CLARA, AND SANTA CRUZ COUNTIES:

	Rates	Fringes
ROOFER		
Bitumastic, Enameler, Coal Tar, Pitch and Mastic worker.....	$ 57.17	21.51
Journeyman.....	$ 53.17	21.51

Kettle person (2 kettles)...$ 55.17 21.51

SFCA0483-001 08/01/2023

ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO AND SANTA CLARA COUNTIES:

	Rates	Fringes
SPRINKLER FITTER (FIRE).....	$ 75.09	37.95

SFCA0669-011 04/01/2023

CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
SPRINKLER FITTER.....	$ 44.32	27.25

SHEE0104-001 07/01/2020

AREA 1: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO, SANTA CLARA

AREA 2: MONTEREY & SAN BENITO

AREA 3: SANTA CRUZ

	Rates	Fringes
SHEET METAL WORKER		
AREA 1:		
Mechanical Contracts		
under $200,000.....	$ 55.92	45.29
All Other Work.....	$ 64.06	46.83
AREA 2.....	$ 52.90	36.44
AREA 3.....	$ 55.16	34.18

SHEE0104-003 07/01/2021

CALAVERAS AND SAN JOAQUIN COUNTIES:

	Rates	Fringes
SHEET METAL WORKER.....	$ 44.34	39.22

SHEE0104-005 07/01/2021

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
SHEET METAL WORKER (Excluding metal deck and siding).....	$ 41.28	45.41

SHEE0104-007 07/01/2021

FRESNO, KINGS, AND MADERA COUNTIES:

	Rates	Fringes

SHEET METAL WORKER.....$ 44.07 40.79

SHEE0104-015 07/01/2020

ALAMEDA, CONTRA COSTA, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA AND SANTA CRUZ COUNTIES:

	Rates	Fringes
SHEET METAL WORKER (Metal Decking and Siding only).....	$ 44.45	35.55

SHEE0104-018 07/01/2020

CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
Sheet metal worker (Metal decking and siding only).....	$ 44.45	35.55

TEAM0094-001 07/01/2022

	Rates	Fringes
Truck drivers:		
GROUP 1.....	$ 36.95	31.14
GROUP 2.....	$ 37.25	31.14
GROUP 3.....	$ 37.55	31.14
GROUP 4.....	$ 37.90	31.14
GROUP 5.....	$ 38.25	31.14

FOOTNOTES:

Articulated dump truck; Bulk cement spreader (with or without auger); Dumpcrete truck; Skid truck (debris box); Dry pre-batch concrete mix trucks; Dumpster or similar type; Slurry truck: Use dump truck yardage rate.

Heater planer; Asphalt burner; Scarifier burner; Industrial lift truck (mechanical tailgate); Utility and clean-up truck: Use appropriate rate for the power unit or the equipment utilized.

TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Dump trucks, under 6 yds.; Single unit flat rack (2-axle unit); Nipper truck (when flat rack truck is used appropriate flat rack shall apply); Concrete pump truck (when flat rack truck is used appropriate flat rack shall apply); Concrete pump machine; Fork lift and lift jitneys; Fuel and/or grease truck driver or fuel person; Snow buggy; Steam cleaning; Bus or personhaul driver; Escort or pilot car driver; Pickup truck; Teamster oiler/greaser and/or serviceperson; Hook tender (including loading and unloading); Team driver; Tool room attendant (refineries)

GROUP 2: Dump trucks, 6 yds. and under 8 yds.; Transit mixers, through 10 yds.; Water trucks, under 7,000 gals.; Jetting trucks, under 7,000 gals.; Single-unit flat rack (3-axle unit); Highbed heavy duty transport; Scissor truck; Rubber-tired muck car (not self-loaded); Rubber-tired truck

jumbo; Winch truck and ""A"" frame drivers; Combination winch truck with hoist; Road oil truck or bootperson; Buggymobile; Ross, Hyster and similar straddle carriers; Small rubber-tired tractor

GROUP 3: Dump trucks, 8 yds. and including 24 yds.; Transit mixers, over 10 yds.; Water trucks, 7,000 gals. and over; Jetting trucks, 7,000 gals. and over; Vacuum trucks under 7500 gals. Trucks towing tilt bed or flat bed pull trailers; Lowbed heavy duty transport; Heavy duty transport tiller person; Self- propelled street sweeper with self-contained refuse bin; Boom truck - hydro-lift or Swedish type extension or retracting crane; P.B. or similar type self-loading truck; Tire repairperson; Combination bootperson and road oiler; Dry distribution truck (A bootperson when employed on such equipment, shall receive the rate specified for the classification of road oil trucks or bootperson); Ammonia nitrate distributor, driver and mixer; Snow Go and/or plow

GROUP 4: Dump trucks, over 25 yds. and under 65 yds.; Water pulls - DW 10's, 20's, 21's and other similar equipment when pulling Aqua/pak or water tank trailers; Helicopter pilots (when transporting men and materials); Lowbedk Heavy Duty Transport up to including 7 axles; DW10's, 20's, 21's and other similar Cat type, Terra Cobra, LeTourneau Pulls, Tournorocker, Euclid and similar type equipment when pulling fuel and/or grease tank trailers or other miscellaneous trailers; Vacuum Trucks 7500 gals and over and truck repairman

GROUP 5: Dump trucks, 65 yds. and over; Holland hauler; Low bed Heavy Duty Transport over 7 axles

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($16.20) or 13658 ($12.15). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union

average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION
"

ATTACHMENT C: SECTION 3 DOCUMENTS

Health, Housing &
Community Services Department
Housing & Community Services Division

Section 3 Bidding Process and Contracting and Subcontracting Requirements

FOR CONTRACTORS

INSTRUCTIONS:

CONTRACTING AND SUBCONTRACTING BID PROCESS FOR SECTION 3 PROJECTS

- All RFPs, procurement documents and bid offerings for City of Berkeley Section 3 projects, must contain the Section 3 bid process and contracting requirements and other relevant documents found in the Section 3 portfolio of documents.
- All contractors and subcontractors submitting bids or proposals to Larkin Street Youth Services are required to certify that they will comply with the requirements of Section 3, as documented through signature of this form.
- All subcontracting opportunities shall be posted at the job site.
- If a business is seeking Section 3 preference it must for the contracting /subcontracting opportunity, before submitting bids/proposals to Larkin Street Youth Services, complete certifications, as appropriate. Such certifications shall be adequately supported with appropriate documentation as referenced in the form *01a. Section 3 Business Concern Certification*.
- *(If Possible)* At the time of bid, ask the subcontractor to present a list, of the number of total labor hours, Section 3 worker labor hours, and Targeted Section 3 worker labor hours expected to be generated from the initial contract and a list of projected number of available positions, to include job descriptions and wage rates.
- *(If Possible)* All subcontractors wishing to submit a bid/offer/proposal are encouraged attend pre-bid meeting. At this meeting the City of Berkeley will provide bidders with assistance regarding understanding the Section 3 requirements and what we expect to see in the bid proposal.

OUTREACH FOR SUBCONTRACTING

- When subcontracting opportunities arise in connection with the Turning Point Rehabilitation project, contractors will notify Larkin Street Youth Services, who will notify the City of Berkeley, using the form *02b. City of Berkeley Section 3 Contracting Notice Form*, so that the City can publicize contracting opportunities for small businesses and Section 3 business concerns.
    - The City of Berkeley, to the greatest extent feasible, will coordinate with the City of Berkeley's Business/Economic Development Department and all other business assistance agencies and contractor associations to inform them of contracting opportunities and request their assistance in identifying Section 3 business concerns.

Health, Housing &
Community Services Department
Housing & Community Services Division

Section 3 Bidding Process and Contracting and Subcontracting Requirements

Could include local community development organizations, business development agencies (Chamber of Commerce), and minority contracting associations.

CONTRACTING AND SUBCONTRACTING
All contracts related to this Section 3 project must include Section 3 requirements. Additionally, all contractors, and subcontractors must meet the prioritization requirements of 24 CFR 75.19, regardless of whether Section 3 language is included in related contracts.

I. WHAT IS SECTION 3?

Section 3 is a provision of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u) that is regulated by the provisions of 24 CFR 75. Section 3 regulations ensure that employment and other economic opportunities generated by certain HUD financial assistance shall, to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, be directed to low- and very low-income persons, particularly those who are recipients of government assistance for housing, and to business concerns which provide economic opportunities to low- and very low-income persons.

Overall Requirement:
All contractors or subcontractors submitting bids or proposals to Larkin Street Youth Services are required to certify that they will comply with the requirements of Section 3.

Contractors and subcontractors will be required to certify that *they will follow* the required prioritization of effort for Section 3 workers, Targeted Section 3 workers, and Section 3 business concerns as outlined in Section IV below. After completion of the project, on the Section 3 Cumulative Report, contractors will be required to certify that *they followed* the prioritization of effort requirements.

If the contractor or subcontractor does not meet the safe harbor requirements, they must provide evidence that they have made qualitative efforts to assist low and very low-income persons with employment and training opportunities.

Health, Housing &
Community Services Department
Housing & Community Services Division

Section 3 Bidding Process and Contracting and Subcontracting Requirements

II. DEFINITIONS

Persons meeting the **Section 3 worker** preference[1] shall demonstrate that they meet one or more of the following criteria currently or when hired within the past five years, as documented in form *01b. Section 3 & Targeted Section 3 Worker Certification*:

1. A low or very low-income resident (the worker's income for the previous or annualized calendar year is below the income limit established by HUD); or
2. Employed by a Section 3 business concern; or
3. A YouthBuild participant.

Persons meeting the **Targeted Section 3 worker** preference[2] shall demonstrate that they meet the **Section 3 Worker** criteria *AND* one or more of the following criteria, as documented in form *01b. Section 3 & Targeted Section 3 Worker Certification*:

1. Employed by a Section 3 business concern (Section 3 business concern must complete Form: *01bi. Section 3 Business Concern Employee Certification*); or
2. Currently meets or when hired met at least one of the following categories as documented within the past five years:
    a. Living within the service area or the neighborhood of the project, as defined in 24 CFR Part 75.5; or
    b. A YouthBuild participant.

Businesses may seek **Section 3 Business Concern** preference by demonstrating that they meet one or more of the following criteria[3], as documented in form *01a. Section 3 Business Concern Certification*.

1. At least 51 percent of the business is owned and controlled by low- or very low-income persons; or
2. At least 51 percent of the business is owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing; or
3. Over 75 percent of the labor hours performed for the business over the prior three-month period are performed by Section 3 workers.

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[1] Complying with California Labor Code Section 432.3 requires that NO potential employer seek or prompt an applicant for their salary history, however, nothing in this section (432.3) shall prohibit an applicant from voluntarily and *without prompting* disclosing salary history information to a prospective employer.

[2] ibid.

[3] ***NOTE: A nonprofit organization cannot qualify as a Section 3 business concern.***
Source: HUD Exchange FAQ ID 4212

Health, Housing &
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Housing & Community Services Division

Section 3 Bidding Process and Contracting and Subcontracting Requirements

III. SAFE HARBOR BENCHMARKS

City of Berkeley has established employment and training goals that subrecipients, contractors, and subcontractors should meet in order to comply with Section 3 requirements outlined in 24 CFR Part 75.19 - for housing and community development financial assistance. The safe harbor benchmark goals are as follows:

1. Twenty-five (25) percent or more of the total number of labor hours worked by all workers on a Section 3 project are Section 3 workers;
   Section 3 Labor Hours/Total Labor Hours = 25%
   And
2. Five (5) percent or more of the total number of labor hours worked by all workers on a Section 3 project are Targeted Section 3 workers, as defined at 24 CFR Part 75.21.
   Targeted Section 3 Labor Hours/Total Labor Hours = 5%

IV. CERTIFICATION OF PRIORITIZATION OF EFFORT FOR EMPLOYMENT, TRAINING, AND CONTRACTING

Section 3 Program, contractors and subcontractors should make best efforts to provide employment[4] and training opportunities to Section 3 workers in the priority order listed below:

EMPLOYMENT AND TRAINING

(1) To the greatest extent feasible, and consistent with existing Federal, state[5], and local laws and regulations, shall ensure that employment and training opportunities arising in connection with Section 3 projects are provided to Section 3 workers within the San Francisco-Oakland-Fremont metropolitan area. AND (2) Where feasible, priority for opportunities and training should be given to:

(i) Section 3 workers residing within the service area or the neighborhood of the project, and
(ii) Participants in YouthBuild programs.

CONTRACTING

(1) To the greatest extent feasible, and consistent with existing Federal, state, and local laws and regulations, shall ensure contracts for work awarded in connection with Section 3 projects are provided to business concerns that provide economic opportunities to Section 3 workers residing within the San Francisco-Oakland-Fremont metropolitan area. AND (2) Where feasible, priority for contracting opportunities should be given to:

[4] Complying with California Labor Code Section 432.3 requires that NO potential employer shall seek or prompt an applicant for their salary history, however, nothing in this section (432.3) shall prohibit an applicant from voluntarily and ***without prompting*** disclosing salary history information to a prospective employer.
[5] ibid.

Health, Housing &
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Section 3 Bidding Process and Contracting and Subcontracting Requirements

(i) Section 3 business concerns that provide economic opportunities to Section 3 workers residing within the service area or the neighborhood of the project, and
(ii) YouthBuild programs

I acknowledge my responsibilities as a potential contractor/subcontractor for a Section 3 project.

Signature: Date:

Bidder Information:

Company Name	Street Address

Name of Representative	Title	City	Zip	Email

FOR ADMINISTRATIVE USE ONLY

Name of Section 3 Project: Larkin Street - Turning Point (AAP PY22 - IDIS 1098)

Health, Housing &
Community Services Department
Housing & Community Services Division

Section 3 Business Concern Certification

24 CFR Part 75.5 Definitions

Description: Businesses seeking a preference in contracting on applicable Section 3 projects may qualify as a Section 3 business concern if they meet the following criteria[1]: At least 51 percent of the business is owned and controlled by low- or very low-income persons, or at least 51 percent of the business is owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing, or over 75 percent of the labor hours performed for the business over the prior three-month period are performed by Section 3 workers.

This tool is designed to help the City of Berkeley and its subrecipients, contractors, and subcontractors comply with the Section 3 requirements and achieve the Section 3 goals. It is intended to help the City of Berkeley certify and track Section 3 business concerns seeking a preference in contracting.

I. Business Concern Affirmation

I affirm that the above statements are true, complete, and correct to the best of my knowledge and belief. I understand that businesses who misrepresent themselves as Section 3 business concerns[2] and report false information to the City of Berkeley may have their contracts terminated as default and be barred from ongoing and future considerations for contracting opportunities. I hereby certify, under penalty of law, that the following information is correct to the best of my knowledge.

Business Name: _____

Name of Person Completing Certification: _____

Signature: _____

Date: _____

Certification expires within six months of the date of signature

Instructions: Enter the following information and select the criteria that applies to certify your business' Section 3 Business Concern status[3]. If your business qualifies as a Section 3 Business Concern and you would like to be notified of other, future Section 3 project opportunities, you may register your business at the HUD Section 3 Opportunity Portal: https://hudapps.hud.gov/OpportunityPortal/

[1] ***NOTE: A NONPROFIT ORGANIZATION CANNOT QUALIFY AS A SECTION 3 BUSINESS CONCERN.***
Source: HUD Exchange FAQ ID 4212

[2] ibid.

[3] ibid.

Health, Housing &
Community Services Department
Housing & Community Services Division

Section 3 Business Concern Certification

24 CFR Part 75.5 Definitions

II. Business Information

Name of Business

Address of Business: _____

Name of Business Owner: _____

Phone Number of Business Owner: _____

Email Address of Business Owner: _____

Preferred Contact Information

☐ Same as above

Name of Preferred Contact _____

Phone Number of Preferred Contact _____

Type of Business (select from the following options)[4]:

☐ Corporation ☐ Partnership ☐ Sole Proprietorship ☐ Joint Venture

III. Select from *ONE* of the following three options below that applies:

☐ At least 51 percent of the business is owned and controlled by low- or very low-income persons (*Refer to income guidelines in Section IV*).

☐ At least 51 percent of the business is owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing.

☐ Over 75 percent of the labor hours performed for the business over the prior three-month period are performed by Section 3 workers (*Refer to 01b. Current Employee Section 3 & Targeted Section 3 Worker Certification*).

[4] ***NOTE: A NONPROFIT ORGANIZATION CANNOT QUALIFY AS A SECTION 3 BUSINESS CONCERN.***
Source: HUD Exchange FAQ ID 4212

Health, Housing &
Community Services Department
Housing & Community Services Division

Section 3 Business Concern Certification

24 CFR Part 75.5 Definitions

IV. Income Guidelines

According to 2022 HUD Income Definitions – The owner's income must be per <u>their place of residence</u> and, be at, or below the amount provided below for an individual (household of 1) regardless of household size.	
Your County of Residence	**Your Income from the last calendar year, or when hired, if hired after November 30, 2020.**
Alameda	At or Below $74,200
Contra Costa	At or Below $74,200
Marin	At or Below $104,400
Sacramento	At or Below $56,750
San Francisco	At or Below $104,400
San Joaquin	At or Below $46,350
San Mateo	At or Below $104,400
Santa Clara	At or Below $92,250
Solano	At or Below $60,800
Stanislaus	At or Below $44,650
Source: https://www.huduser.gov/portal/datasets/il.html	

FOR ADMINISTRATIVE USE ONLY

Name of Section 3 Project: _____

If a Developer or Contractor enters into a contract with a Section 3 Business Concern, they must certify the businesses Section 3 Business Concerns qualifications through this form and keep this verification in their Section 3 compliance file for *<u>five years</u>*.

Health, Housing &
Community Services Department
Housing & Community Services Division

Current Employee Section 3 & Targeted Section 3 Worker Certification

24 CFR Part 75.5 Definitions & 75.21 Targeted Section 3 worker

The purpose of HUD's Section 3 program is to provide employment, training and contracting opportunities to low-income individuals, particularly those who are recipients of government assistance for housing or other public assistance programs. **Your response is voluntary, confidential, and has no effect on your employment.**

Eligibility for Section 3 Worker and Targeted Section 3 Worker Status
A Section 3 worker seeking certification shall self-certify and submit this form to the recipient contractor or subcontractor. It certifies that the person is a Section 3 Worker and/or Targeted Section 3 Worker as defined in 24 CFR Part 75.

Attention Employer: *Complying with California Labor Code Section 432.3 requires that **NO** potential employer prompt an applicant to complete and turn in this completed form to the potential employer, and that employers only prompt new employees to fill out this form after accepting a wage/salary.*

Instructions for Employee: *This form is for current employees only*, see note above, please enter/select the appropriate information, and include supporting documentation, where required, to confirm your Section 3 Worker and/or Targeted Section 3 Worker status.

Instructions for Employer: Please ask all current employees working on the project to complete this form, and keep this form on file for five years.

Thank you for assisting us!

Sincerely,

City of Berkeley's Health, Housing and Community Services Department

I. Employee Affirmation

I affirm that the statements below are true, complete, and correct to the best of my knowledge and belief. I hereby certify, under penalty of law, that the following information is correct to the best of my knowledge.

Signature:	Date:

II. Employee Information:

Name:	Position/Title:	Hire Date:

Health, Housing &
Community Services Department
Housing & Community Services Division

Current Employee Section 3 & Targeted Section 3 Worker Certification

24 CFR Part 75.5 Definitions & 75.21 Targeted Section 3 worker

Address: City: Zip: Phone:	Do you live in Public Housing or Section 8 Participant? Yes ☐ No ☐ Are you a Section 3 Worker? (As defined in Section III, of this form, Section 3 and Targeted Section 3 Worker Determination Checklist) Yes ☐ No ☐ Are you a Targeted Section 3 Worker[1]? (As defined in Section III, of this form, Section 3 and Targeted Section 3 Worker Determination Checklist) Yes ☐ No ☐ Are you currently homeless or formerly homeless? Yes ☐ No ☐ Are you currently on Public Assistance? (Food Stamps, etc.) Yes ☐ No ☐ Are you a Veteran or recent college graduate? Yes ☐ No ☐ Are you a Single Mother re-entering the workforce? Yes ☐ No ☐ Are you an apprentice? Yes ☐ No ☐

III. Section 3 and Targeted Section 3 Worker Determination Checklist

- SECTION 3 WORKER:

Currently meets ***or when hired*** met at least one of the following categories as documented ***within the past five years***[2]:

☐ My income, *based on my place of residence*, for the previous or annualized calendar year, was below the income limit established by HUD, listed below.

According to 2021 HUD Income Definitions – The worker's income must be per their place of residence and, be at, or below the amount provided below for an individual (household of 1) regardless of household size.	
Your County of Residence	**Your Income from the last calendar year, or when hired, if hired after November 30, 2020.**
Alameda	At or Below $76,750
Contra Costa	At or Below $76,750
Marin	At or Below $102,450
Sacramento	At or Below $50,750
San Francisco	At or Below $102,450
San Joaquin	At or Below $41,450
San Mateo	At or Below $102,450
Santa Clara	At or Below $82,450
Solano	At or Below $54,350
Stanislaus	At or Below $39,950
Source: https://www.huduser.gov/portal/datasets/il.html	

[1] You must qualify as a Section 3 Worker to qualify as a Targeted Section 3 Worker.
[2] The five-year period for a worker cannot begin before November 30, 2020, the effective date of the final rule.

Health, Housing &
Community Services Department
Housing & Community Services Division

Current Employee Section 3 & Targeted Section 3 Worker Certification

24 CFR Part 75.5 Definitions & 75.21 Targeted Section 3 worker

☐ I am employed by a Section 3 business concern.

Recordkeeping requirement: An employer's certification that the worker is employed by a Section 3 business concern.

☐ I am a YouthBuild participant.

If you qualify as a Section 3 Worker, please proceed to determine if you also qualify as a Targeted Section 3 Worker.

- TARGETED SECTION 3 WORKER[3]:

☐ I'm employed by a Section 3 business concern.

Recordkeeping requirement: An employer's certification that the worker is employed by a Section 3 business concern.

Currently meets ***or when hired*** met at least one of the following categories as documented ***within the past five years[4]:***

☐ I live within the service area or the neighborhood of the project, as defined in 24 CFR 75.5.

Recordkeeping requirement: An employer's confirmation that a worker's residence is within one mile of the work site or, if fewer than 5,000 people live within one mile of a work site, within a circle centered on the work site that is sufficient to encompass a population of 5,000 people according to the most recent U.S. Census (24 CFR 75.5);

☐ I am a YouthBuild participant.

FOR EMPLOYER USE ONLY

Name of Section 3 Project: _____

Name of Employer: _____

Address of Employer: _____

City, State, Zip Code of Employer: _____

Employer Representative Reviewing Form: _____

Date of Review: _____ **Supporting Documents Saved?** ☐ **Yes** ☐ **No**

The employer must keep this verification in their Section 3 compliance file for *five years*.

ATTACHMENT D: REQUIREMENTS FOR CDBG-FUNDED CONSTRUCTION CONTRACTS

Requirements for CDBG-Funded Construction Contracts

(to be included in all contracts between a non-profit subrecipient of CDBG funds and the General Contractor)

A. Contractor shall observe and comply with all applicable laws, ordinances, codes and regulations under the requirements of the Community Development Block Grant program (CFDA Number 14.218) from the federal Department of Housing and Urban Development (HUD).

B. Contractor shall observe and comply with all other applicable laws, ordinances, codes and regulations of governmental agencies, including federal, state, municipal, and local governing bodies, having jurisdiction over the scope of services or any part thereof, including all provisions of the Occupational Safety and Health Act of 1979 and all amendments thereto, and all applicable federal, state, municipal, and local safety regulations. All services performed by Contractor must be in accordance with these laws, ordinances, codes, and regulations including but not limited to the following:

1. Equal Employment Opportunity: The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

2. Minority and Women-Owned Contractors: Consistent with state and federal laws and regulations, contractor shall take all necessary affirmative steps to use small business and minority- and women-owned business sources of supplies and services ((24 CFR 85.36(e) or 84.44(b)).

3. Hazardous Materials: Contractor is required to keep and maintain the Property in compliance with, and shall not cause or permit the Property to be in violation of any federal, state or local laws, ordinances or regulations relating to industrial hygiene or to the environmental conditions on, under or about the Property including, but not limited to, soil and ground water conditions. Contractor shall not use, generate, manufacture, store or dispose of on, under, or about the Property or transport to or from the Property any flammable explosives, radioactive materials, hazardous wastes, toxic substances or related materials, including without limitation, any substances defined as or included in the definition of "hazardous substances," hazardous wastes," "hazardous materials," or "toxic substances" under any applicable federal or state laws or regulations (collectively referred to hereinafter as "Hazardous Materials") except such of the foregoing as may be customarily used in construction of projects like the Project or kept and used in and about property of this type.

4. Environmental and Historic Preservation: Section 104(f) of the Housing and Community Residence Act of 1974 and 24 C.F.R. Part 58, which prescribe procedures for compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4361), and the additional laws and authorities listed at 24 C.F.R. 58.5.

5. Applicable OMB Circulars: The applicable policies, guidelines, and requirements of OMB Circulars Nos. A-110, A-122, and A-133.

6. Debarred, Suspended or Ineligible Contractors: By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1). No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1). The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.

7. Civil Rights, Housing & Community Development, and Age Discrimination Acts: The Fair Housing Act (42 U.S.C. 3601 et seq.) and implementing regulations at 24 C.F.R. 100 et seq.; Title VI of the Civil Rights Act of 1964 as amended; Title VIII of the Civil Rights Act of 1968 as amended; Section 104(b) and Section 109 of Title I of the Housing and Community Development Act of 1974 as amended; Section 50 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975; Executive Order 11063 as amended by Executive Order 12259 and implementing regulations at 24 C.F.R. 107; Executive Order 11246 as amended by Executive Orders 11375, 12086, 11478, 12107; Executive Order 11625 as amended by Executive Order 12007; Executive Order 12432; Executive Order 12138 as amended by executive Order 12608.

8. Lead-Based Paint: The requirement of the Lead-Based Paint Poisoning Prevention Act, as amended (42 U.S.C. 4821 et seq.), the Residential Lead-Based Paint Hazard Reduction Act (42 U.S.C. 4851 et seq.), and implementing regulations at 24 C.F.R. Part 35. Such requirements prohibit the use of lead- based paint for construction, rehabilitation, or modernization of residential structures; mandate the elimination of immediate lead-based paint hazards in residential structures assisted with CDBG funds; and require the notification of the hazards of lead-based paint poisoning to purchasers and tenants of residential structures constructed prior to 1950 and assisted with CDBG funds.

9. Discrimination Against the Disabled: The requirements of Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794), and federal regulations issued pursuant thereto, which prohibit discrimination against the disabled

in any federally assisted program, the requirements of the Architectural Barriers Act of 1968 (42 U.S.C. 4151-4157), and the applicable requirements of Title II and/or Title III of the Americans with Disabilities Act of 1990 (42 U.S.C. 12131 et seq.), and federal regulations issued pursuant thereto.

10. Clean Air and Water Acts: The Clean Air Act, as amended, 42 U.S.C. 1859 et seq., the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 C.F.R. Part 15, as amended from time to time.

11. Uniform Administrative Requirements: The requirements of 24 C.F.R. 507.502(b) regarding cost and auditing requirements.

12. Training Opportunities: This contract is covered by the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701. Section 3 requires that, to the greatest extent feasible, opportunities for training and employment be given to lower income residents of the project area and agreements for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in, the areas of the project. Subcontractors awarded more than $100,000 in connection with the Section 3-covered construction activity must also comply with the Section 3 regulations referenced above. Contractor agrees to include the following language in all subcontracts greater than $100,000 executed under this Agreement: "The work to be performed under this agreement is a project assisted under a program providing direct federal financial assistance from HUD and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended 12 U.S.C. 1701. Section 3 requires that to the greatest extent feasible opportunities for training and employment be given to lower income residents of the project area and agreements for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in, the areas of the project."

13. Labor Standards – Federal: The prevailing wage requirements of the Davis-Bacon Act and implementing rules and regulations (40 U.S.C. 276a-276a-5); the Copeland "Anti-Kickback" Act (47 U.S.C. 276(c)) which requires that workers be paid at least once a week without any deductions or rebates except permissible deductions; the Contract Work Hours and Safety Standards Act – CWHSSA (40 U.S.C. 327-333) which requires that workers receive "overtime" compensation at a rate of 1-1/2 times their regular hourly wage after they have worked forty (40) hours in one (1) week; the Fair Labor Standards Act of 1938, as Amended (20 U.S.C. 201, et seq.) which provides minimum wage levels, overtime pay for more than

forty hours per week, record keeping, and established child labor standards; the Housing and Community Development Act of 1974, as Amended (section 110) which requires all mechanics employed by Contractor or Subcontractors on CDBG funded or CDBG assisted construction contracts in excess of $2,000 to be paid wages no less than those prescribed by the Department of Labor and in accordance with Davis Bacon Related Acts; and Title 29, Code of Federal Regulations, Subtitle A, parts 1.3 and 5 are the regulations and procedures issued by the Secretary of Labor for the administration and enforcement of the Davis-Bacon Act, as amended. Compliance is also required as outlined in the attached HUD Form 4010, Federal Labor Standards Provisions.

14. State Prevailing Wages: Section 1771, et seq. of the Labor Code, the general prevailing wage rates in the county, in which the work is to be done as determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates available from the California Department of Industrial Relations' Internet web site at http://www.dir.ca.gov/DLSR/PWD. If there is a difference between the minimum wage rates predetermined by the (federal) Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate, which most closely approximates the duties of the employees in question. If no federal funds are used on this contract, Contractor shall only be obligated to comply with Section 1771 et seq. of the Labor Code.

15. Drug Free Workplace: The requirements of the Drug Free Workplace Act of 1988 (P.L. 100-690) and implementing regulations at 24 C.F.R. Part 24.

16. HUD Regulations: Any other HUD regulations present or as may be amended, added, or waived in the future pertaining to the contract funds, including but not limited to HUD regulations as may be promulgated regarding subrecipients.

C. Subcontracts: The Contractor or subcontractor shall insert in any subcontracts all the provisions contained in this clause, and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the

subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions.

D. HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until three years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

END OF SECTION

DOCUMENT 00 7316

SUPPLEMENTARY CONDITIONS – INSURANCE AND INDEMNIFICATION

ARTICLE 1 – INSURANCE

1.01 At or before the date specified in Document 00 2113 (Instructions to Bidders), Contractor shall furnish to City of Berkeley ("City") satisfactory proof that Contractor has taken out for the entire period covered by the Contract the following classes of insurance in the form and with limits and deductibles specified below, unless otherwise specified in Contract Documents:

A. Comprehensive General Liability Insurance covering claims for personal injury, bodily injury and property damage arising out of the Work and in a form providing coverage not less than that of a Standard Commercial General Liability Insurance policy ("Occurrence Form"). Such insurance shall provide for all operations and include independent contractors, products liability, completed operations for one year after Final Completion and acceptance of the final payment for the Work, contractual liability, and coverage for explosion, collapse, and underground hazards. The limits of such insurance shall not be coverage of less than **$2,000,000** each occurrence, **$2,000,000** general aggregate limit, and **$2,000,000** aggregate for products and completed operations, with defense costs payable in addition to policy limits. The policies shall be endorsed to provide Broad Form Property Damage Coverage.

B. Comprehensive Automobile Liability Insurance covering all owned, non-owned, and hired vehicles. Such insurance shall provide coverage not less than the standard Comprehensive Automobile Liability policy with limits not less than **$2,000,000** each occurrence Bodily Injury, and **$2,000,000** each occurrence Property Damage.

C. All-Risk Course of Construction Insurance including damage to property owned by City, Contractor or third parties caused by fire. Insurance shall be in the amount of 100 percent of the completed value of the Work to be performed under this Contract. Deductible shall not exceed **$10,000**. Each loss shall be borne by Contractor.

D. Workers' Compensation Insurance for all persons whom the Contractor may employ in carrying out Work contemplated under Contract Documents, in accordance with the Act of Legislature of State of California, known as "Workers' Compensation Insurance and Safety Act," approved May 26, 1913, and all acts amendatory or supplemental thereto, in the statutory amount. Workers' Compensation Insurance is **$1,000,000** each accident, with defense cost payable in addition to policy limits.

E. ~~**[Option]** Environmental Impairment Liability Insurance covering bodily injury and property damage utilizing an occurrence policy form, in an amount no less than **$1,000,000** combined single limit for each occurrence, subject to a **$1,000,000** aggregate applicable to each job, with defense costs payable in addition to policy limits. The minimum deductible or self-insured retention permissible is **$25,000** each occurrence.~~

1.02 All policies of insurance shall be placed with insurers acceptable to City. The insurance underwriter(s) for all insurance policies except Workers' Compensation shall have an A. M. Best Company rating of A-, VIII or better, unless otherwise specified in Contract Documents. Required minimum amounts of insurance may be increased should conditions of Work, in opinion of City, warrant such increase. Contractor shall increase required insurance amounts upon direction by City.

1.03 Required Endorsements: The policies required under Document 00 7200 (General Conditions) and this Document 00 7316 shall be endorsed as follows:

A. City of Berkeley, its officers, agents, volunteers, consultants, and employees shall be named as additional insureds, but only with respect to liability arising out of the activities of the named insured, and there shall be a waiver of subrogation as to each named and additional insured.

B. Each such policy shall apply separately to each insured against whom claim is made or suit is

brought, except with respect to the limit of the insurance company's liability required hereunder. Should any of the policies identified herein contain a "cross-suits" exclusion, such exclusion must not apply to any additional insureds.

C. Written notice of cancellation or of any limits reduction change in said policy shall be mailed to the City thirty (30) calendar days in advance of the effective date thereof, and ten (10) calendar days written notice to the same in advance of payment of any insurance claims under such policies to any person, firm or entity.

D. Insurance shall be primary insurance and no other insurance or self-insured retention carried or held by any named or additional insureds shall be called upon to contribute to a loss covered by insurance for the named insured.

1.04 Written notice of cancellation, non-renewal, or reduction in coverage of any policy shall be mailed to City (Attention: Project Manager and the Construction Manager) at the address listed in Document 00 5200 (Agreement), 30 calendar days in advance of the effective date of the cancellation, non-renewal, or reduction in coverage. Written notice of cancellation for non-payment shall be mailed within 10 calendar days of cancellation.

1.05 Certificates of insurance and endorsements shall have clearly typed thereon City Specification Number, and Title of Project of Contract Documents. Contractor shall maintain insurance in full force and effect during entire period of performance of Contract Documents.

1.06 Contractor shall keep insurance in force during warranty and guarantee periods, except that Contractor may discontinue All-Risk Course of Construction Insurance after Final Payment. At time of making application for extension of time, and during all periods exceeding the Contract Time resulting from any cause, Contractor shall submit evidence that insurance policies will be in effect during requested additional period of time. Upon City's request, Contractor shall submit to City, within 30 calendar days, copies of the actual insurance policies or renewals or replacements.

1.07 Contractor shall pay all insurance premiums, including any charges for required waivers of subrogation or the endorsement of additional insureds. If Contractor fails to maintain insurance, City may take out comparable insurance, and deduct and retain amount of premium from any sums due Contractor under Contract Documents.

1.08 If injury occurs to any employee of Contractor, Subcontractor or sub-subcontractor for which the employee, or the employee's dependents in the event of employee's death, is entitled to compensation from City under provisions of the Workers' Compensation Insurance and Safety Act, as amended, or for which compensation is claimed from City, City may retain out of sums due Contractor under Contract Documents, amount sufficient to cover such compensation, as fixed by the Act, as amended, until such compensation is paid, or until it is determined that no compensation is due. If City is compelled to pay compensation, City may, in its discretion, either deduct and retain from the Contract Sum the amount so paid, or require Contractor to reimburse City.

1.09 Nothing herein shall be construed as limiting in any way the extent to which Contractor or any Subcontractor may be held responsible for payment of damages resulting from their operations.

1.10 All Subcontractors shall maintain the same insurance required to be maintained by Contractor with respect to their portions of the Work unless otherwise indicated in Contract Documents, and Contractor shall cause the Subcontractors to furnish proof thereof to City within ten calendar days of City's request.

1.11 The following provisions apply to any licensed professional engaged by Contractor to perform portions of the Work ("Professional").

A. Each Professional shall maintain the following insurance, unless otherwise specified in Contract Documents:

B. Professional Liability Insurance, insuring against professional errors and omissions arising from Professional's Work on the Project, in an amount not less than **$2,000,000** combined single limit for each occurrence. If Professional cannot provide an occurrence policy, Professional shall

provide insurance covering claims made as a result of performance of Work on this Project and shall maintain such insurance in effect for not less than two years following Final Completion of the Project.

C. Professional shall satisfy all other provisions of this Document 00 7316 relating to that insurance, including without limitation providing required insurance certificates (containing the required endorsements) before commencing its Work on the Project.

ARTICLE 2 – RESPONSIBILITY OF CONTRACTOR AND INDEMNIFICATION

2.01 City and each of its officers, employees, consultants and agents including, but not limited to, the Board, Project Manager and Construction Manager and each City's Representative, shall not be liable or accountable in any manner for loss or damage that may happen to any part of the Work; loss or damage to materials or other things used or employed in performing the Work; injury, sickness, disease, or death of any person; or damage to property resulting from any cause whatsoever except their sole negligence, willful misconduct or active negligence, attributable to performance or character of the Work, and Contractor releases all of the foregoing persons and entities from any and all such claims.

2.02 To the furthest extent permitted by law (including without limitation California Civil Code §2782), Contractor shall assume defense of, and indemnify and hold harmless, City and each of its officers, employees, consultants and agents, including but not limited to the Board, Project Manager and Construction Manager and each City's Representative, from claims, suits, actions, losses and liability of every kind, nature and description, including but not limited to claims and fines of regulatory agencies and attorney's fees and consultant's fees, directly or indirectly arising out of, connected with or resulting from performance of the Work, failure to perform the Work, or condition of the Work which is caused in whole or part by any act or omission of Contractor, Subcontractors, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, resulting from any cause whatsoever except their sole negligence, willful misconduct or active negligence.

2.03 With respect to third-party claims against Contractor, Contractor waives any and all rights to any type of express or implied indemnity against City and each of its officers, employees, consultants and agents including, but not limited to City, the Board, Project Manager and Construction Manager and each City's Representative. City shall provide timely notice to Contractor of any third-party claim relating to the Contract Documents, in accordance with Section 9201 of the California Public Contract Code.

2.04 Approval or purchase of any insurance contracts or policies shall in no way relieve from liability nor limit the liability of Contractor, its Subcontractors of any tier, or the officers or agents of any of them.

2.05 To the furthest extent permitted by law (including, without limitation, Civil Code §2782), the indemnities, releases of liability and limitations of liability, claims procedures, and limitations of remedy expressed throughout Contract Documents shall apply even in the event of breach of Contract, negligence (active or passive), fault or strict liability of the party(ies) indemnified, released, or limited in liability, and shall survive the termination, rescission, breach, abandonment, or completion of the Work or the terms of the Contract Documents. If Contractor fails to perform any of these defense or indemnity obligations, City may in its discretion back charge Contractor for City's costs and damages resulting therefrom and withhold such sums from progress payments or other Contract moneys which may become due.

2.06 The indemnities in the Contract Documents shall not apply to any indemnified party to the extent of its sole negligence or willful misconduct; nor shall they apply to City or other indemnified party to the extent of its active negligence.

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DOCUMENT 00 7317

SUPPLEMENTARY CONDITIONS – CITY OF BERKELEY CONTRACTING POLICIES

ARTICLE 1 – GENERAL

1.01 DESCRIPTION

A. This document includes requirements which supplement the sections of the General Conditions.

1.02 PROHIBITED DISCRIMINATION. The following paragraphs shall be added to the General Conditions as a new Article 16.A, and, with the additions set forth in paragraphs 1.03 through 1.08, below, shall constitute a new Section 16 of Document 00 7200, General Conditions, entitled "16: City of Berkeley Contracting Policies".

"16. A PROHIBITED DISCRIMINATION: During prosecution of the Work to be done under the Contract, Contractor shall comply with the provisions of Berkeley Municipal Code ("B.M.C.") Chapter 13.26, including, but not limited to, the following:

1. Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, ancestry, national origin, age (over 40), sex, pregnancy, marital status, disability, sexual orientation or AIDS.

2. Contractor shall permit the City access to records of employment, employment advertisements, application forms, EEO-1 forms, affirmative action plans and any other documents which, in the opinion of the City, are necessary to monitor compliance with this non-discrimination provision. In addition, Contractor shall submit forms supplied by the City to monitor this non-discrimination provision."

1.03 CONFLICTS OF INTEREST PROHIBITED. The following paragraphs shall be added to Document 00 7200, General Conditions, as a new Section:

"16. B CONFLICTS OF INTEREST PROHIBITED:

1. In accordance with Government Code section 1090, Berkeley City Charter section 36 and B.M.C. Chapter 3.64, neither Contractor nor any employee, officer, director, partner or member of Contractor or immediate family member of any of the preceding, shall have served as an elected officer, an employee, or a City board, committee or commission member, who has directly or indirectly influenced the making of the Agreement.

2. In accordance with Government Code section 1090 and the Political Reform Act, Government Code section 87100 *et seq*., no person who is a director, officer, partner, trustee, employee or consultant of the Contractor, or immediate family member of any of the preceding, shall make or participate in a decision made by the City or a City board, commission or committee, if it is reasonably foreseeable that the decision will have a material effect on any source of income, investment or interest in real property of that person or Contractor.

   a. Interpretation of this section shall be governed by the definitions and provisions used in the Political Reform Act, Government Code section 87100 *et seq*., its implementing regulations, manuals and codes, Government Code section 1090, Berkeley City Charter section 36 and B.M.C. Chapter 3.64."

1.04 NUCLEAR FREE BERKELEY ORDINANCE. The following paragraphs shall be added to Document 00 7200, General Conditions, as a new Section:

"16. C NUCLEAR FREE BERKELEY ORDINANCE:

1. Contractor agrees to comply with B.M.C. Chapter 12.90, the Nuclear Free Berkeley Act, as amended from time to time."

1.05 CONTRACTUAL RELATIONS WITH PROHIBITED ENTITIES. The following paragraphs shall be added to Document 00 7200, General Conditions, as a new Section:

"16. D CONTRACTUAL RELATIONS WITH PROHIBITED ENTITIES

1. OPPRESSIVE STATES

a. In accordance with Resolution No. 59,853-N.S. (Appendix 00812-A), Contractor certifies that it has no contractual relations with, and agrees during the term of this agreement to forego contractual relations to provide personal services to, the following entities:

1. The governing regime in any Oppressive State.
2. Any business or corporation organized under the authority of the governing regime of any Oppressive State.
3. Any individual, firm, partnership, corporation, association, or any other commercial organization, and including parent-entities and wholly-owned subsidiaries (to the extent that their operations are related to the purpose of its contract with the City), for the express purpose of assisting in business operations or trading with any public or private entity located in any Oppressive State.

b. Appendix A to Resolution No. 59,853-N.S., and Resolution No. 60,382-N.S. and 70,606-N.S. designates the following as Oppressive States for the purposes of this Contract:

1. Tibet Autonomous Region and the provinces of Ado, Kham, and U-Tsang; and Burma (Myanmar)

c. Contractor's failure to comply with this section shall constitute a default of this Contract and City may terminate the Contractor's right to proceed with the Work pursuant to Document 00 7200, General Conditions, Article 14.05.

1. In the event that the City terminates Contractor due to a default under this provision, City may deem Contractor a non-responsible bidder for five (5) years from the date this Contract is terminated."

1.06 REQUIRED AND PROHIBITED WORK MATERIALS. The following paragraphs are added to Document 00 7200, General Conditions, as a new Section:

"16. E REQUIRED AND PROHIBITED WORK MATERIALS

1. RECYCLED PAPER

a. If Contractor is required by this Agreement to prepare a written report or study, Contractor shall use recycled paper for said report or study when such paper is available at a cost of not more than ten percent more than the cost of virgin paper, and when such paper is available at the time it is needed. For the purposes of this Agreement, recycled paper is paper that contains at least 50% recycled product. If recycled paper is not available, Contractor shall use white paper. Written reports or studies prepared under this Agreement shall be printed on both sides of the page whenever practical.

TROPICAL HARDWOODS

a. Contractor shall comply with the terms of Resolution No. 58,291-N.S. (Appendix 00812-B) prohibiting the use of any tropical hardwood or wood product, including, but not limited to, those enumerated in Resolution No. 58,291-N.S. Contractor must submit, with its bid, a statement Tropical Hardwood Disclosure form.

b. Except as expressly permitted by the application of Sections 3.B and 4.B. of Resolution No. 58,291-N.S., Contractor shall not provide any items to the City in performance of this contract which are tropical hardwoods or tropical wood products.

c. Contractor's failure to comply with this section shall constitute a default of this Agreement and Contractor agrees that City may take any of the following actions:

1. terminate the Contractor’s right to proceed with the Work pursuant to Document 00 7200, General Conditions, Article 14.05;

2. withhold funds due the Contractor under any contract with the City;

3. order revision of the Contract Documents based upon a material breach of Contract Documents provisions or pertaining to representations made in bidding, execution or performance of the Contract Documents;

4. disqualify the Contractor from eligibility for providing commodities or services to the City for a period not to exceed five (5) years, with a right to review and reconsideration by the City after two (2) years upon a showing of corrective action, indicating violations are not likely to recur.

d. Notwithstanding Article 4 of the Agreement, Contractor acknowledges and agrees that its failure to comply with this requirement justifies the imposition of liquidated damages in an amount equal to Contractor's net profit, or five percent (5%) of the total contract amount, whichever is greater.

1. Liquidated damages under this provision shall be payable to the City upon demand and may be set off against any monies due to the Contractor from any contract with the City.

3. VIRGIN REDWOOD

a. Contractor agrees to comply with the City Council's October 29, 1996, directive not to purchase virgin redwood for the prosecution of the work to be done under this Contract and in its place purchase and use:

1. Redwood that has been previously used or;

2. Certified, sustainable-harvested redwood as the preferred alternative to virgin and non-certified redwood, and not pressure-treated lumber of other species as an alternative to redwood."

4. TREATED WOOD

a. Contractor shall comply with the terms of Resolution No. 61,724-N.S. (Appendix 00812-E) prohibiting the use of Pentachlorophenol, arsenic and creosote treated wood. No such wood shall be used by the contractor in this or any other City project without the express written consent of the City Council.

1.07 COMMUNITY WORKFORCE AGREEMENT. The following paragraph shall be added to Document 00 7200 (General Conditions) as a new Section if the contract exceeds $500,000.

"16.F COMMUNITY WORKFORCE AGREEMENT

1. Contractor and any subcontractor at any tier shall comply with the City's Community Workforce Agreement set forth in the Appendix 00812 C.

a. Under the Community Workforce Agreement, Contractor must sign and comply with the Agreement to be Bound prior to execution of the Contract.
b. Subcontractors at any tier must also sign and comply with an Agreement to be Bound prior to execution of their respective subcontracts.
c. The signing of an Agreement to be Bound is a condition precedent to entering into any contract for this project."

1.08 EQUAL BENEFITS ORDINANCE. The following paragraph shall be added to Document 00 7200 (General Conditions) as a new Section:

"16.G EQUAL BENEFITS ORDINANCE:

1. Contractor hereby agrees to comply with the provisions of the Berkeley Equal Benefits Ordinance, B.M.C. Chapter 13.29 (Appendix 00812-D). If Contractor is currently subject to the Berkeley Equal Benefits Ordinance, as indicated by the Equal Benefits Certification form, as contained in Document 00680, Contractor will be required to provide all eligible employees with City mandated equal benefits, as defined in B.M.C. Chapter 13.29, during the term of this contract, as well as comply with the terms enumerated herein.

2. If Contractor is currently or becomes subject to the Berkeley Equal Benefits Ordinance, Contractor agrees to provide the City with all records the City deems necessary to determine compliance with this provision. These records are expressly subject to the auditing terms described in Document 00 7200, General Conditions, Article 8.02.

3. If Contractor fails to comply with the requirements of this Article, City shall have the rights and remedies described in this Section, in addition to any rights and remedies provided by law or equity.

3. Contractor's failure to comply with this Article shall constitute a material breach of the Contract, upon which City may terminate the Contractor's right

to proceed with the Work pursuant to Document 00 7200, General Conditions, Article 14.05. In the event the City terminates the Contractor's right to proceed with the Work due to a default by Contractor under this Article, the City may deem Contractor a non-responsible bidder for not more than five (5) years from the date this Contract is terminated. In addition, at City's sole discretion, Contractor may be responsible for liquidated damages in the amount of $50.00 per employee per day for each and every instance of violation of this Section. It is mutually understood and agreed that Contractor's failure to provide its employees with equal benefits will result in damages being sustained by City; that the nature and amount of these damages will be extremely difficult and impractical to fix; that the liquidated damages set forth herein is the nearest and most exact measure of damages for such breach that can be fixed at this time; and that the liquidated damage amount is not intended as a penalty or forfeiture for Contractor's breach. City may deduct any assessed liquidated damages from any payments otherwise due Contractor.

1.09 SANCTUARY CITY CONTRACTING: The following paragraph shall be added to Document 00 7200 (General Conditions) as a new Section:

"16. H SANCTUARY CITY ORDINANCE:

1. Contractor hereby agrees to comply with the provisions of the Sanctuary City Contracting Ordinance, B.M.C. Chapter 13.105. In accordance with this Chapter, Contractor agrees not to provide the U.S. Immigration and Customs Enforcement Division of the United States Department of Homeland Security with any Data Broker or Extreme Vetting Services as defined herein:

    a. "Data Broker" means either of the following:

    ii. The collection of information, including personal information about consumers, from a wide variety of sources for the purposes of reselling such information to their customers, which include both private-sector business and government agencies;

    iii. The aggregation of data that was collected for another purpose from that for which it is ultimately used.

    b. "Extreme Vetting" means data mining, threat modeling, predictive risk analysis, or other similar services. Extreme Vetting does not include:

    i. The City's computer-network health and performance tools;

    ii. Cybersecurity capabilities, technologies and systems used by the City of Berkeley Department of Information Technology to predict, monitor for, prevent, and protect technology infrastructure and systems owned and operated by the City of Berkeley from potential cybersecurity events and cyber-forensic based investigations and prosecutions of illegal computer based activity."

SCHEDULE OF APPENDENCES
TO
MODIFICATIONS TO GENERAL CONDITIONS

Schedule of Exhibits: (the following Exhibits are on file at the Berkeley City Clerk's office and will be made available on request to any interested party)

A. City Council Resolution No. 59,853-N.S. (Re: Oppressive States).

B. City Council Resolution No. 58,291-N.S. (Re: Tropical Hardwoods).

C. City Council Resolution No. 61,724-N.S. (Re: Treated Wood).

D. Berkeley Municipal Code, Chapter 13.29, Equal Benefits Ordinance

E. Community Workforce Agreement and Agreement to be Bound for contract exceeding $500,000.

F. Sanctuary City Contracting Ordinance, B.M.C. Chapter 13.105.

END OF DOCUMENT

DOCUMENT 00 7319

SUPPLEMENTARY CONDITIONS – HEALTH AND SAFETY REQUIREMENTS; HAZARDOUS MATERIALS

ARTICLE 1 – GENERAL

1.01 Summary

A. This document includes requirements as they apply to location, removal, remediation and disposal of hazardous materials and hazardous waste.

1.02 HAZARDOUS MATERIALS SURVEY

A. Reference Section 01 1100, Part 1.15 for a list of available documents, including any Hazardous Materials Surveys, if available.

B. Data regarding the locations of hazardous materials was obtained only for use of City and its consultants, contractors, and tenants for planning and design and are not part of Contract Documents.

C. Bidders may rely on this data and information for general accuracy regarding the locations of potentially hazardous materials subject of the Work. City does not warrant and makes no representation regarding the completeness or thoroughness of any data or information regarding existing conditions or hazardous materials, including, but not limited to, quantities, characteristics, volumes, or associated structural features. Bidder represents and agrees that in submitting a Bid it is not relying on any such data, information or deductions.

D. Before submitting a Bid, each Bidder shall be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of Contract Documents.

E. Bidders shall advise City in writing during the Bid period of any questions, suppositions, inferences or deductions Bidders may have for City's review and response. City has provided time in the period prior to bidding for Bidder to perform these investigations.

F. During the Pre-Bid Site Visit(s), City will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. Bidders must fill all holes and clean up and restore the Site to its former conditions upon completion of such explorations, investigations, tests, and studies. Such investigations may be performed only under the provisions of Document 00 2113 (Instructions to Bidders) and Document 00 7200 (General Conditions) including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such investigation work. Each Bidder shall supply all equipment required to perform any investigations as each Bidder deems necessary. City has the right to limit the number of pieces of machinery operating at one time due to safety concerns.

1.03 Precedence of Documents

A. Should any provision or requirement of any Contract Document conflict with another provision or requirement in the Contract Documents on subject matters of hazardous waste abatement, clean up, disposal, or required safety standards or methods, then the most stringent provision or requirement shall control.

1.04 Means and Methods of Construction

A. Nothing contained in these Contract Documents or inferable therefrom shall be deemed or

construed (1) to make Contractor the agent, servant or employee of City, or (2) to create any partnership, joint venture or other association between City and Contractor.

1.05 Control of the Work

A. City shall exercise administration of the Contract. The City may employ a consultant to assist. City reserves the right to assign or delegate to this consultant, or any other consultant ("Consultant") any or all of the responsibilities of the Architect/Engineer under the Contract Documents, or alternatively, to act as City's representative.

B. Contractor shall cooperate with Consultant as directed by City. Consultant's duties may include observing the Contractor's health and safety program and practices, observing the abatement construction activities, observing the contractor's abatement work practices for compliance with the Contract Documents, observing the extent of material removed from each job site, reviewing payment requests, reviewing reports required by governmental or quasi-governmental agencies or the Contract Documents, and providing clearance tests after abatement is completed. No action, omission to act, approval, or failure to advise Contractor as to any matter by Consultant shall in any way relieve the Contractor from its responsibility for the performance of the Work in strict accordance with the Contract Documents and applicable Law.

1.06 Warranty, Guarantee and Inspection of Work.

A. Contractor represents and warrants that it, its employees and its subcontractors and their employees, shall at all times have the required levels of familiarity with the Site and the Work, training and ability to comply fully with all applicable Law and contract requirements for safe and expeditious performance of the Work, including whatever training is or may be required regarding the activities to be performed (including, but not limited to, all training required to adequately address the actual or potential dangers of contract performance).

B. Contractor represents and warrants that it, its employees and its subcontractors and their employees, shall at all times have and maintain in good standing any and all certifications and licenses required by applicable federal, state and other governmental and quasi-governmental requirements applicable to the Work.

C. Contractor represents and warrants that it has studied carefully all requirements of the specifications regarding procedures for demolition, hazardous waste abatement, or safety practices, specified in this contract, and prior submitting its bid, has either (a) verified to its satisfaction that the specified procedures are adequate and sufficient to achieve the results intended by the Contract Documents, or (b) by way of approved "or equal" request or request for clarification and written Addenda, secured changes to the specified procedures sufficient to achieve the results intended by the Contract Documents. Contractor accepts the risk that any specified procedure will result in a completed project in full compliance with the contract requirements.

D. City reserves the right, in its sole discretion, to conduct air monitoring, earth monitoring, work monitoring, and any other tests (in addition to testing required under the agreement or applicable law), to monitor contract requirements of safe and statutory compliant work methods and (where applicable) safe re-entry level air standards under State and Federal law upon completion of the job, and compliance of the work with periodic and final inspection of public and quasi-public entities having jurisdiction.

E. Contractor acknowledges that City also has the right to perform, or cause to be performed, various activities and tests including, but not limited to, pre-abatement, during abatement and post-abatement air monitoring, provided that City shall have no obligation to perform said activities and tests, and that a portion of said activities and tests may take place prior to the completion of the Work by Contractor. In the event City elects to perform these activities and tests, Contractor shall afford City ample access to the Site and all areas of the Work as may be necessary for the performance of these activities and tests. Contractor will include the potential impact of these activities for tests by City in the Contract Sum and the Scheduled Completion Date. Contractor shall not be entitled to increases in the contract sum or any damages for delay in the event City elects to perform these activities and tests, provided any delays resulting therefrom are reasonable under the circumstances involved. Notwithstanding City's rights

granted by this paragraph, Contractor shall retain its own industrial hygiene consultant and shall have primary responsibility for collecting samples and perform all applicable, relevant or appropriate activities and tests including, but not limited to, pre-abatement, during abatement and post-abatement air monitoring, required or suggested by the Contract Documents, the Law, or both, and City reserves the right to request documentation of all such activities and tests performed by Contractor relating to the Work.

1.07 RECORDS

A. Contractor shall obtain and maintain and shall furnish to City on completion of the Work, or at any other time requested by City, all necessary permits, licenses, approvals, authorizations, notifications, training certificates, respirator certificates, reports, correspondence, test results, air monitoring certificates, forms, medical records, medical certificates, notes and photographs of work conditions, approved shipping and disposal facility receipts, manifests, and all other documentation required by the Contract Documents or applicable Law, or both.

B. Contractor shall provide City with copies of each such document as it is generated and shall, as a condition to final payment, provide City with a complete set of such documents (bound, organized and indexed) at the conclusion of the Work. Contractor shall keep and maintain in retrievable files true and correct copies of all such documents for a period of not less than thirty (30) years after final completion of the Work. City shall have the right to inspect or photocopy these records and, if Contractor should cease business operations, then it shall furnish these records to City.

1.08 Compliance with laws

A. Contractor represents that it is familiar with shall comply with all laws applicable to the Work or completed Work including, but not limited to, all federal, state and local laws, statutes standards, rules, regulations and ordinances applicable to the Work (collectively, the "Law") relating to:

1. the protection of the public health, welfare and environment;
2. storage, handling or use of asbestos, PCB, lead, petroleum based products or other hazardous materials;
3. the generation, processing, treatment, storage, transport, disposal, destruction or other management of asbestos, PCB, lead, petroleum or hazardous waste materials or other waste materials of any kind; or,
4. the protection of environmentally sensitive areas such as wetlands.

B. Contractor has the sole responsibility for determining current waste storage, handling, transportation and disposal regulations for the jobsite and for each waste disposal facility. Contractor must comply fully at its sole cost and expense with these regulations and any applicable Law. City, may, but is not obligated to, require submittals with this information for it to review consistent with the Contract Documents.

C. Contractor shall develop and implement a system acceptable to City to track hazardous waste from the site to disposals, including appropriate "Hazardous Waste Manifests" on the EPA form, so that City may track the volume of waste it put in each landfill and receive from each landfill a certificate of receipt.

D. Contractor shall provide City with the name and address of each waste disposal facility prior to any disposal, and City shall have the express right to reject any proposed disposal facility. Contractor shall not use any disposal facility to which City has objected. Contractor shall document actual disposal or destruction of waste at a designated facility by completing a disposal certificate or certificate of destruction forwarding the original to the general contractor.

1.09 Permits

A. Before performing any of the Work, and at such other times as may be required by applicable Law, Contractor shall deliver all requisite notices and obtain the approval of all governmental and quasi-governmental authorities having jurisdiction over the Work. Contractor shall submit evidence satisfactory to City that it and any disposal facility (1) have obtained all required permits, approvals and the like in a timely manner both prior to commencement of the Work and thereafter as and when required by applicable Law, and (2) are in compliance with all such permits,

approvals and the like. For example, before commencing any work in connection with the Work involving asbestos-containing materials or PCB subject to regulation, Contractor agrees to provide the required notice of intent to renovate or demolish to the appropriate state or federal agency having jurisdiction, by certified mail, return receipt requested, or by some other method of transmittal for which a return receipt is obtained, and to send a copy of that notice to City. Contractor shall not conduct any Work involving asbestos-containing materials or PCB unless Contractor has first confirmed that the appropriate agency having jurisdiction is in receipt of the required notification. All permits, licenses, bonds required by governmental or quasi-governmental authorities, fees, deposits, tap fees, offsite easements and asbestos and PCB disposal facilities necessary for the prosecution of the Work shall be procured and paid for by Contractor. Contractor shall give all notices and comply with the Law bearing on the conduct of the Work as drawn and specified. If Contractor observes or reasonably should have observed that Plans and Specifications and other Contract Documents are at variance therewith, it shall be responsible for promptly notifying City in writing of such fact. If Contractor performs any Work contrary to the Law without such notice to City, it shall bear all costs arising therefrom.

B. In the case of any permits or notices held in City's name or of necessity to be made in City's name, City shall cooperate with Contractor in securing the permit or giving the notice, but the Contractor shall prepare for City's review and execution upon approval, all necessary applications, notices and other materials.

1.10 Indemnification and Termination

A. To the extent permitted by law, the indemnities and limitations of liability expressed throughout the Contract Documents apply with equal force and effect to any claims or liabilities imposed or existing by virtue of the removal, abatement and disposal of hazardous waste. This includes liabilities connected to the selection and use of a waste disposal facility, personal injury, property damage, loss of use of property, damage to the environment or natural resources, or "disposal" and "release" of materials associated with the Work (as defined in 42 U.S.C. 9601 et seq).

B. Notwithstanding anything in Document 00 7200 to the contrary, City shall have an absolute right to terminate the Contractor’s right to proceed with the Work for cause immediately, without ten calendar days notice and without an opportunity to cure, should Contractor knowingly or recklessly commit a material breach of the terms of the Contract Documents or the Law, on any matter involving the exposure of persons or property to hazardous waste. However, if the breach of contract exposing persons or property to hazardous waste is due solely to an ordinary, unintentional and non-reckless failure to exercise reasonable care, then the procedures in Document 00 7200, Article 14.05, shall apply without modification.

1.11 Protection of Work, Persons and Property

A. Contractor shall perform safe, expeditious and orderly work in accordance with the best practices and the highest standards in the hazardous waste abatement, removal and disposal industry, the Law (as herein defined), and the Contract Documents, including, but not limited to, all responsibilities relating to the preparation and return of waste shipment records, all requirements of the Law, delivering of all requisite notices, and obtaining all necessary governmental and quasi governmental approvals.

END OF DOCUMENT

DOCUMENT 00 7380

APPRENTICESHIP PROGRAM

ARTICLE 1 – COMPLIANCE REQUIRED

1.01 Contractor and Subcontractors shall comply with the requirements of California Labor Code §§1776, 1777.5, and 1777.6 concerning the employment of apprentices by Contractor or Subcontractors. Willful failure to comply may result in penalties, including loss of the right to Bid on or receive public works contracts.

ARTICLE 2 – CERTIFICATION OF APPROVAL

2.01 California Labor Code §1777.5, as amended, requires a Contractor or Subcontractor employing tradespersons in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of a public works project and which administers the apprenticeship program in that trade for a certification of approval. The certificate shall also fix the ratio of apprentices to journeypersons that will be used in performance of the Contract. The ratio of work performed by apprentices to journeypersons in such cases shall not be less than one *hour* of apprentices work for every five *hours* of labor performed by journeypersons (the minimum ratio for the land surveyor classification shall not be less than one apprentice for each five journeypersons), except:

A. When unemployment for the previous three month period in the area exceeds an average of 15 percent;

B. When the number of apprentices in training in the area exceeds a ratio of one to five;

C. When a trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis state-wide or locally; or

D. Assignment of an apprentice to any work performed under a public works contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyperson.

ARTICLE 3 – FUND CONTRIBUTIONS

3.01 Contractor is required to make contributions to funds established for administration of apprenticeship programs if Contractor employs registered apprentices or journeypersons in any apprenticeable trade on such contracts and if other contractors on the public works site are making such contributions.

ARTICLE 4 – APPRENTICESHIP STANDARDS

4.01 Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of the California Department of Industrial Relations, or from the Division of Apprenticeship Standards and its branch offices.

END OF DOCUMENT

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DOCUMENT 00 9113

ADDENDA

SPECIFICATION NO. 21-11604-C

CITY OF BERKELEY

WEST BERKELEY SERVICE CENTER IMPROVEMENT PROJECT

1900 SIXTH STREET, BERKELEY, CA 94710

[DOCUMENT TO BE COMPLETED AS ADDENDA DURING BID PERIOD]

[If a conformed copy is created, delete bracketed line above and replace with the following:]

The following Addenda were issued, modifying the Project Manual:

Addendum No. 1, issued on **[date]**
Addendum No. 2, issued on **[date]**
[continue as appropriate]

(Addenda have been incorporated into the conformed Project Manual.)

END OF DOCUMENT

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 1100

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes Summary of Work and Work Restrictions including:

1. Work Covered By Contract Documents
2. Bid Item, Allowances and Alternates
3. Contract Document Organization
4. Maintenance
5. Work Under Other Contracts
6. Future Work
7. Work Sequence
8. Work Days and Hours
9. Shutdown for Discovery of Cultural Resources
10. Cooperation of Contractor and Coordination with Other Work
11. Partial Occupancy/Utilization Requirements
12. Contractor Use of Site
13. Air Quality Standards
14. Construction Staking, Monument Protection and Replacement
15. Geotechnical Data and Existing Conditions
16. Protection of Existing Structures and Underground Facilities
17. Permits
18. Actual Damages for Permit Violations
19. Reference Standards
20. Products Ordered in Advance
21. City-Furnished Products

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. Work comprises of the construction of City's **West Berkeley Service Center Improvement Project** located at **1900 Sixth Street, Berkeley, CA 94710**. The Work includes, without limitation, new roofing, upgraded electrical distribution system, upgraded mechanical systems for new restroom configuration, minor interior modifications required for electrical and mechanical work, removal of exiting fire place, new exterior porch structure, expanded exterior storage, removal of existing water heater and installation of new water heater, and new entry accessible ramp. Contract Documents fully describe the Work.

B. The Work of this Contract comprises construction of all the Work indicated, described in the Specifications, or otherwise required by the Contract Documents. Unless provided otherwise in the Contract Documents, all risk of loss to Work covered by Contract Documents shall rest with Contractor until Final Acceptance of the Work. Cost of maintenance of systems and equipment prior to Final Acceptance will be considered as included in prices Bid and no direct or additional payment will be made therefore.

C. For all Bid items, furnish and install all Work, including connections to existing systems, indicated and described in Specifications and all other Contract Documents. Work and requirements applicable to each individual Bid item, or unit of Work, shall be deemed incorporated into the description of each Bid item (whether Lump Sum or Unit Price). Any Bid item may be deleted from the Work and Contract Sum, in total or in part, prior to or after award of Contract without compensation in any form or adjustment of other Bid items or prices therefore.

D. Allowance Work shall be done as Change Orders and as specified in Section 01 2600 (Modification Procedures). Identify Allowance Items (See Document 00 4113 [Bid Form]) work on the Progress Schedules and on Applications for Payment. The Amount given on Document 00 4113 (Bid Form) under each Allowance Item is the sum of money set aside for each Allowance Item. These amounts shall be included in the Contract Sum on the Bid Form. If the cost of Work done under any Allowance Item is less than the amount given on the Bid Form under that Allowance Item, the Contract Sum shall be reduced by the difference between the amount given in the Bid Form and the cost of Work actually done.

1.03 BID ITEMS, ALLOWANCES AND ALTERNATES

A. Descriptions of Lump Sum Items (listed by Bid item numbers):

1. **Bid Item #1: All of the work included in the Contract Documents and shown on the plans except the Landscape work (sheets L1.0, L2.0, L3.0, L4.0, L6.0, L6.1, L9.0, and L9.1). The exterior storage structure, new playground fencing, exterior fabric structure (shade sail) and the courtyard canopy are all considered to NOT be part of the Landscape work and ARE considered part of Bid Item #1.**

B. Descriptions of Unit Price Items and Basis of Measurement for Payment (listed by Bid item numbers): **N/A**

C. Allowances: **(N/A)**

D. Bid Deduct Alternates:

1. **Deduct Alternate 1: All work associated with improvements to Exterior Storage #31 including, but not limited to, new walls, roof structure, roofing, new footings, and new downspouts and drainage to parking lot.**
2. **Deduct Alternate 2: All work associated with the installation of new playground fencing (see Sheet A7.21) including, but not limited to, new foundations, fence structure, and entry gate.**
3. **Deduct Alternative 3: All work associated with exterior fabric structure (shade sail) including, but not limited to, the structural support column, attachment to Exterior Storage #31, fabric, and mounting/tensioning hardware.**
4. **Deduct Alternate 4: Exterior courtyard canopy at Alcove #17 including, but not limited to, new steel columns, column footings, roof framing, roofing, structural modifications at existing building along line 5, and modifications to existing line 5 gutter.**

1.04 CONTRACT DOCUMENT ORGANIZATION

A. The Drawings illustrate locations, arrangements, dimensions, and details to determine the general character of the Work. Parts not detailed shall be subject to the Architect's approval. Where reasonably inferable that a Drawing illustrates only part of a given work on a number of items, the remainder shall be deemed repetitious and so construed. Drawings of greater scale take precedence over Drawings of lesser scale. Do not scale documents.

B. Drawings indicate general arrangement and location of such items as piping, conduit, apparatus, and equipment. Drawings and Specifications are for guidance of the Contractor and exact locations, distances, and levels will be governed by building site and actual building conditions. The Contractor shall make minor changes, as directed, to arrangements or locations shown in order to meet Structural or Architectural conditions.

C. Specifications describe performances and qualities required of materials and of methods. Items listed under each Section of the Specifications are not necessarily all inclusive. The Contractor shall be responsible for the complete work.

D. For convenience, Specifications are separated into topical divisions of work, each of which is further related to topical divisions under which it occurs. Such separation shall not be construed

as an attempt by the Architect to establish limits of any agreements between the Contractor and his/her subcontractors.

E. Portions of these Specifications are of abbreviated, simplified type and may include incomplete sentences.

1. Omissions of words or phrases such as “the Contractor shall”, “in conformity with”, “shall be”, “as noted on the Drawings”, “in accordance with the details”, “a”, “the”, “all”, “any”, and “each” are intentional. Omitted words or phrases shall be supplied by inference.
2. Terms such as “approved”, “or approved equal”, “as directed”, “as required”, “as provided”, “acceptable”, and “satisfactory” mean by or to the Architect or the City.
3. Furnish: The term furnish means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
4. Install: The term install describes operations at the Project Site, including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar ions.
5. Provide: The term provide means to furnish and install, complete and ready for the intended use.

F. Reference Standards

1. For products specified by association or trade standards, comply with requirements of the standard except where more rigid requirements are specified or are required by applicable codes.
2. The date of the standard is that in effect as of bid date except where specific date is specified

1.05 MAINTENANCE

A. Cost of maintenance of systems and equipment prior to Final Acceptance will be considered as included in prices bid and no direct or additional payment will be made therefor.

1.06 WORK UNDER OTHER CONTRACTS

A. None expected

1.07 FUTURE WORK

A. None expected

1.08 WORK SEQUENCE

A. Construct Work in stages and at times to accommodate City operation requirements during the construction period; coordinate construction schedule and operations with City.

1.09 WORK DAYS AND HOURS

A. Work Days and hours: Monday-Friday inclusive, **[7:00 a.m.-5:00 p.m.]** local time.

B. Work at the Site on weekends or holidays is not permitted, unless Contractor requests otherwise from City in writing at least 48 hours in advance and City approves in its sole discretion.

1.10 SHUTDOWN FOR DISCOVERY OF CULTURAL RESOURCES

A. If discovery is made of items of historical archaeological or paleontological interest, immediately cease all Work in the area of discovery. Archaeological indicators may include, but are not limited to, dwelling sites, locally darkened soils, stone implements or other artifacts, fragments of glass or ceramics, animal bones, human bones, and fossils. After cessation of excavation, immediately contact City. Do not resume Work until authorization is received from City. When resumed, excavation or other activities shall be as directed by City.

1.11 COOPERATION OF CONTRACTOR AND COORDINATION WITH OTHER WORK

A. Coordinate with City and any City forces, or other contractors and forces, as required by Document 00 7200 (General Conditions).

1.12 PARTIAL OCCUPANCY/UTILIZATION REQUIREMENTS

A. Allow City to take possession of and use any completed or partially completed portion of the Work during the progress of the Work as soon as is possible without interference to the Work.

B. Possession, use of Work, and placement and installation of equipment by City shall not in any way evidence the completion of the Work or any part of it.

C. Contractor shall not be held responsible for damage to the occupied part of the Work resulting from City occupancy.

D. Make available, in areas occupied, on a 24 hour per day and 7 day per week basis if required, any utility services, heating, and cooling in condition to be put in operation at the time of occupancy.

1. Responsibility for operation and maintenance of said equipment shall remain with Contractor.
2. Make, and City shall certify, an itemized list of each piece of equipment so operated with the date operation commences.
3. Itemized list noted above shall be basis for commencement of warranty period for equipment.
4. City shall pay for utility cost arising out of occupancy by City during construction.

E. Use and occupancy by City prior to acceptance of Work does not relieve Contractor of its responsibility to maintain insurance and bonds required under the Contract until entire Work is completed and accepted by City.

F. Prior to date of Final Acceptance of the Work by City, all necessary repairs or renewals in Work or part thereof so used, not due to ordinary wear and tear, but due to Defective materials or workmanship or to operations of Contractor, shall be made at expense of Contractor, as required in Document 00 7200 (General Conditions).

G. Use by City of Work or part thereof as contemplated by this Section 01 1100 shall in no case be construed as constituting acceptance of Work or any part thereof. Such use shall neither relieve Contractor of any responsibilities under Contract, nor act as waiver by City of any of the conditions thereof.

H. City may specify in the Contract Documents that portions of the Work, including electrical and mechanical systems or separate structures, shall be substantially completed on dates described in this Section 01 1100, if any, prior to Substantial Completion of all of the Work. Notify City in writing when Contractor considers any such part of the Work ready for its intended use and Substantially Complete and request City to issue a Certificate of Substantial Completion for that part of the Work.

1.13 CONTRACTOR USE OF SITE

A. Access is available to the Site from Sixth Street. Contractor shall ensure that the entrance and site is secure at the end of each work day and at other times as may be necessary to control unauthorized entry.

B. Contractor shall contact City at least 5 Business Days prior to entering the building and performing Work to allow City to arrange access into the building. Access Request forms shall be submitted five days in advance of anticipated on-site Work to gain permission to enter Site and to allow notification to occupants.

C. Confine operations at Site to areas permitted by Contract Documents, permits, ordinances, and laws. Do not unreasonably encumber Site with materials or equipment.

D. Assume full responsibility for protection and safekeeping of products stored on premises. Move any stored products that interfere with operations of City or other contractor.

E. Coordinate parking, storage, staging, and Work areas with City. City will review and approve the proposed storage area for Contractor's equipment and materials. Do not store construction materials in the dripline of any tree.

F. Prior to commencement of Work or excavation, Contractor and City shall jointly survey the area adjacent to the Project area making permanent note and record of such existing damage such as cracks, sags or other similar damage. This record shall serve as a basis for determination of subsequent damage to structures, conditions or other existing improvements due to Contractor's operations. All parties making the survey shall sign the official record of existing damage. Cracks, sags or damage of any nature to the adjacent Project area, not noted in the original survey but subsequently noted, shall be reported immediately to City.

G. The Contractor shall follow all city ordinances in force during the duration of this Contract.

H. It is essential that the Contractor perform the Work with as little interference and disturbance as possible to the surrounding neighborhood.

I. When suspect materials, outside the scope of Work, are encountered during the Work or restoration process, the Contractor shall immediately contact the Project Manager for evaluation and approval of the methods for dealing with the material.

1.14 AIR QUALITY STANDARDS

A. Ensure that idling time for all heavy equipment is minimized to reduce on-Site emissions.

B. Maintain equipment in good mechanical condition.

C. Cover trucks hauling dirt.

D. Limit dust emissions during periods of high winds (greater than 15 miles per hour).

E. Replace ground cover in disturbed areas as soon as possible.

F. Enclose, cover, water, or apply soil binders to exposed stockpiles.

G. Remove earth tracked onto neighboring paved roads at least once daily.

H. Limit equipment speed to 10 miles per hour in unpaved areas.

1.15 CONSTRUCTION STAKING, MONUMENT PROTECTION AND REPLACEMENT

A. Notify City at least three (3) Business Days prior to the need for initial staking. City will provide engineering surveys, City benchmarks, corner records, reference points, and/or monument cards that in City's judgment are necessary to establish site elevations for the Contractor to establish construction stakes in order to enable Contractor to proceed with the Work.

B. If Contractor finds any additional information is necessary, notify City in writing 2 Business Days in advance. City shall have no liability for any inadequacy unless Contractor notifies City and City fails to cure within 3 Business Days of such notice.

C. Contractor shall be responsible for laying out the Work and provide all construction staking. Contractor shall replace or repair construction stakes at own expense.

D. Contractor shall perform brush clearing and traffic control, as necessary, in City's sole judgment.

E. The Contractor shall protect and preserve all existing survey monuments, benchmarks, reference points, property monuments and stakes.

F. Whenever Contractor knows or reasonably should know that any Work activity is likely to damage or destroy any survey monuments, benchmarks, reference points, property monuments, or construction stakes, or require relocation because of necessary changes in grades or locations, provide at least 3 Business Days advance notice to City. Survey monuments, benchmarks, reference points and property monuments shall not be disturbed until authorized by the City.

G. Whenever the Contractor disturbs or removes any survey monuments, benchmarks, reference points, or property monuments, the Contractor shall replace the monument in accordance with

City Standard Plan 8090 or City Standard Plan 8091, as applicable. Standard Plans are available upon request. Monument casings (boxes and lids) shall be provided by the Contractor, and dome brass markers shall be supplied by the City.

H. In the event that any non-referenced monuments become in danger of being disturbed due to construction, the Contractor shall cease the threatening activity and notify the City immediately. Response to endangered monuments is a priority call, and each monument shall be referenced in accordance with the City of Berkeley Monument Reference Guidelines, available upon request. In no case may an unreferenced monument be damaged during construction.

I. Should any monument not designated for replacement sustain damage during construction, the Contractor shall bear the expense for rebuilding it as well as for the survey work the City survey crew or its survey consultant must perform in the process. In any instance where the City deems a damaged monument to be irreplaceable, the contractor shall be fined $20,000 per monument.

J. Monument replacement must be done in a neat, workman-like manner. Pavement cuts shall be accurate, with vertical cuts to exact dimensions as shown on the Standard Plans. Monument boxes and lids shall be placed at the proper finished grade and as detailed by Standard Plan 8090 or Standard Plan 8091. Existing monument lids shall be salvaged by the Contractor and delivered to the City.

K. Each replacement monument shall be constructed such that the center of the dome brass marker is set within 0.04 foot of the referenced position. The new dome brass marker shall not receive final punching prior to seven (7) calendar days after completion of the monument construction.

L. In any event, notify City whenever any survey monuments, benchmarks, reference points, or property monuments are lost or destroyed or require relocation because of necessary changes in grades or locations.

M. If the City has elected to reference known monuments around or within the project site, a copy of the corner records for the referenced monuments shall be provided to the Contractor prior to the start of construction. For each monument that has been disturbed or removed, the replacement monument location(s) will be established by the City's survey crew or its survey consultant after final pavement is completed and upon request by the Contractor.

N. All City of Berkeley Monuments located within the project area must be referenced, prior to work commencing, by a licensed land surveyor as required by Section 8771 of the Business and Professions Code. Corner Records of this work must be submitted for filing to both the County Surveyor of Alameda County, and the City of Berkeley, Public Works Department, Engineering Division, Survey Section.

O. Illegible survey requests or requests without proper notification (at least 3 Business Days in advance), may result in delayed response. No extension of Contract Time will be allowed due to such delays.

1.16 GEOTECHNICAL DATA AND EXISTING CONDITIONS

A. Available Documentation: In accordance with, and subject to, the provisions of Document 00 3132 (Geotechnical Data and Existing Conditions), the following documentation is available for review. This information is not part of the Contract Documents.

1. **[vicinity map]**
   [location]
   [prepared by]
   [date prepared]

2. **[name of report or data]**
   [location]
   [prepared by]
   [date prepared]

1.17 PROTECTION OF EXISTING STRUCTURES AND UNDERGROUND FACILITIES

A. The Drawings may indicate existing above- and below-grade structures, drainage lines, storm drains, sewers, water lines, gas lines, electrical lines, hot water lines, and other similar items and Underground Facilities that are known to City. At least (2) two Business Days, or as otherwise noted, prior to commencement of excavation, notify the owners of the following Underground Facilities:

1. **Water lines:** EBMUD
2. **Sewer lines**: Berkeley Public Works Department
3. **Telephone Conduit**: Telephone Provider
4. **Cable**: Cable Provider
5. **Electrical Lines**: PG&E

B. Where overhead service to a structure, known to receive service, does not exist, then underground service shall be assumed to exist.

C. Attention is also directed to the existence of overhead power and telephone lines.

D. Perform pot-holing by hand within 24 inches (in any direction) of the Underground Facilities. This may be done on an area-by-area basis, but shall be accomplished at least 7 calendar days in advance of the date of construction within such area.

E. Telemetry antennas: Ensure that the telemetry and voice communication antennas located on the [Identify the Building] roof remain operational. City's telemetry system is critical to the function and operation of Owner's water supply and distribution system. Coordinate relocation of equipment related to the telemetry and voice communication systems with Owner. Notify Owner 3 calendar days prior to conducting any Work in the vicinity of the telemetry antenna.

F. No attempt has been made to locate utilities on private property such as sprinkler irrigation systems or electrical conduits on the project site or adjacent property. Contractor is responsible for contacting all property owners as necessary, and locating and marking utilities in the vicinity of the work prior to construction.

G. In addition to reporting, if a utility is damaged, Contractor must take appropriate action as provided in Document 00 7200 (General Conditions).

H. Additional compensation or extension of time on account of utilities not indicated or otherwise brought to Contractor's attention including reasonable action taken to protect or repair damage shall be determined as provided in Document 00 7200 (General Conditions).

1.18 PERMITS

A. Permits, agreements, or written authorizations that are known by City to apply to this Project are listed below:

1. Storm Water Pollution Prevention
2. Cal/OSHA Permit. Obtain, as applicable, permit(s) as required by Cal/OSHA for the following:
   a. Construction of trenches or excavations that are five feet or more in depth and into which a person is required to descend.
   b. Construction or demolition of any building, structure, or scaffolding for falsework more than three stories high, or the equivalent height (36 feet).
   c. Erection or dismantling of vertical shoring systems more than three stories high, or the equivalent height (36 feet).
3. The local Cal/OSHA district office is located at:

   CAL/OSHA Headquarters
   1515 Clay Street, Suite 1901
   Oakland, CA 94612

(510) 286-7037

B. All other permits that may be required, such as electrical, mechanical, fire prevention, irrigation, grading, slope protection, tree cutting, etc., have not been applied for and shall be obtained by Contractor. Applicable permit fees will be reimbursed to the extent specified in Document 00 7200 (General Conditions).

1.19 ACTUAL DAMAGES FOR PERMIT VIOLATIONS

A. In addition to damages which are impracticable or extremely difficult to determine, for which liquidated damages will be assessed as described in Document 00 5200 (Agreement) and Document 00 7200 (General Conditions), City may incur actual damages, including fines imposed by any regulatory agency, resulting from use in violation of legal or regulatory requirements where the violations result from Contractor's activities. Continuous operation in compliance with legal or regulatory requirements is essential to avoid discharges that would violate applicable regulations. Violations or threatened violations may subject City to fines or occurrence and/or other costs or civil liabilities.

B. Contractor shall be liable for and shall pay City the amount of any actual losses in addition to liquidated damages or other remedies provided by the Contract Documents.

C. The amount of liquidated damages provided in Document 00 5200 (Agreement) and Document 00 7200 (General Conditions) is not intended to include, nor does the amount include, any damages incurred by City for reasons other than those listed in that paragraph. Any money due or to become due to Contractor may be retained by City to cover both the liquidated and the actual damages described above and, should such money not be sufficient to cover such damages, City shall have the right to recover the balance from Contractor or its sureties.

PART 2 - PRODUCTS

2.01 REFERENCE STANDARDS

A. For products specified by association or trade standards, comply with requirements of standard, except where more rigid requirements are specified or are required by applicable codes.

2.02 PRODUCTS ORDERED IN ADVANCE

A. As provided in Document 00 7200 (General Conditions) and Section 01 2000 (Measurement and Payment), and subject to all other provisions of the Contract Documents, City will pay for the following materials and equipment prior to incorporation into the Work:

1. **None**

2.03 CITY-FURNISHED PRODUCTS

A. City-Furnished Products:

1. None

B. City's Responsibilities:

1. Arrange for and deliver City-reviewed Shop Drawings, Product Data, and Samples, to Contractor.
2. Arrange and pay for delivery to Site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, Defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

C. Contractor's Responsibilities:

1. Review City-reviewed Shop Drawings, Product Data, and Samples.
2. Receive and unload products at Site; inspect for completeness or damage jointly with City.
3. Handle, store, install, and finish products.
4. Repair or replace items damaged after receipt.
5. Install into Project per Contract Documents.

PART 3 - EXECUTION – NOT USED

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 2000

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes description of requirements and procedures for determining amount of Work performed and for obtaining payment for Work performed.

1.02 REFERENCES

A. California Public Contract Code

B. Code of Civil Procedures

C. Government Code

1.03 COMPOSITION AND SCOPE OF CONTRACT SUM

A. Scope of Contract Sum

1. The Contract Sum for performance of the Work under Contract Documents, or under any Bid item, allowance, or Alternate, shall include full compensation for all Work required under the Contract Documents, including without limitation, all labor, materials, taxes, transport, handling, storage, supervision, administration, and all other items necessary for the satisfactory completion of the Work, whether or not expressly specified or indicated, incidental work and unexpected expenses, and all terms, conditions, requirements and limitations set forth in the Contract Documents.
2. Contract Sum may be expressed as lump sum, unit price, GMP, allowance, or combination thereof.

B. Unit Price items

1. Quantity of Work to be paid for under any item for which a unit price is fixed in Contract Documents shall be determined by City based on, so far as practicable, actual number of units satisfactorily completed, as determined by City and certified by Contractor, within prescribed or ordered limits, and no payment will be made for Work unsatisfactorily performed or done outside of limits.
2. Unit Prices shall apply to Work covered by unit prices so long as actual quantities performed on the Project are not less than 75 percent or greater than 125 percent of the estimated quantities bid or otherwise stated in the Contract Documents. If actual quantities exceed these parameters, then the unit price shall be adjusted by an amount to reflect the Contractor's incremental cost differential resulting from increased or decreased economies of scale.

C. Lump Sum Items

1. When estimated quantity for specific portion of Work is not indicated and/or Work is designated as lump sum, payment will be on a lump sum basis for Work satisfactorily completed in accordance with Contract Documents.
2. Payment for lump sum Work, or items of Work subject to a lump sum (e.g. without limitation, change order work), shall be made on the basis of satisfactory completion of such Work or work item, earned in progressive stages in accordance with the Contract Documents, up to but not exceeding the Contractor's percentage completion of the Work or item.
3. Lump sum items shall be paid based upon the approved Schedule of Values, which shall be

used to measure progressive payments based upon satisfactory progress towards completion of the item.

D. Allowance Items

1. Allowances: Allowance Work will be authorized by City in writing, following change order procedures to determine cost, supporting documentation and authorization to proceed. Unused allowance amounts at Contract completion shall reduce the Contract price accordingly.

1.04 PAYMENT PROCEDURES

A. Schedule of Values:

1. Within ten calendar days from issuance of Notice of Award and prior to the Contractor's first Application for Payment, Contractor shall submit a detailed breakdown of its Bid by scheduled Work items and/or activities, including coordination responsibilities and Project Record Documents responsibilities. Where more than one Subcontractor comprises the work of a Work item or activity, the Schedule of Values shall show a separate line item for each subcontract. Contractor shall furnish such breakdown of the total Contract Sum by assigning dollar values (cost estimates) to each applicable Progress Schedule network activity, which cumulative sum equals the total Contract Sum. This breakdown shall be referred to as the Schedule of Values.
2. Contractor's overhead, profit, insurance, cost of bonds (except to the extent expressly identified in a Bid item) and/or other financing, as well as "general conditions costs," (e.g., Site cleanup and maintenance, temporary roads and access, off-Site access roads, temporary power and lighting, security, and the like), shall be prorated through all activities so that the sum of all the Schedule of Values line items equals Contractor's total Contract Sum, less any allowances designated by City. Scheduling, record documents and quality assurance control shall be separate line items.
3. City will review the breakdown in conjunction with the Progress Schedule to ensure that the dollar amounts of this Schedule of Values are, in fact, reasonable cost allocations for the Work items listed. Upon favorable review by City, City will accept this Schedule of Values for use. City shall be the sole judge of fair market cost allocations.
4. City will reject any attempt to increase the cost of early activities, i.e., "front loading," resulting in a complete reallocation of moneys until such "front loading" is corrected. Repeated attempts at "front loading" may result in suspension or termination of the Work for default, or refusal to process progress payments until such time as the Schedule of Values is acceptable to City.

B. Contractor's Requests for Progress Payments

1. If requested by Contractor, progress payments will be made monthly, under the following conditions:
2. On or before the 25th Day of each month, Contractor shall submit to City five copies of an Application for Payment for the cost of the Work put in place during the period from the last Day of the previous month to the end of the current month, along with one copy of an updated Progress Schedule. Such Applications for Payment shall be for the expected total value of activities completed or partially completed, based upon Schedule of Values prices (or Bid item prices if unit price) of all labor and materials incorporated in the Work up until midnight of the last Day of that one month period, less the aggregate of previous payments. Accumulated retainage shall be shown as separate item in payment summary. City and Contractor will reconcile any differences in the field, based on the reconciled monthly report sheets. If Contractor is late submitting its Application for Payment, that Application may be processed at any time during the succeeding one-month period, resulting in processing of Contractor's Application for Payment being delayed for more than a Day for Day basis.
3. Except as otherwise provided in a labor compliance program applicable to the Work (if any) or as otherwise required by City, concurrently with each Application for Payment, Contractor shall submit to the City the Contractor's and its Subcontractors' certified payroll records required to be maintained pursuant to Labor Code Section 1776 for all labor performed during pay periods

ending during the period covered by the Application for Payment.

4. No progress payment will be processed prior to City receiving all requested, acceptable schedule update information and certified payrolls, and in City's sole and absolute discretion, City may deny the entire Application for Payment for noncompliance.
5. Each Application for Payment shall list each Change Order and Construction Change Directive ("CCD") executed prior to date of submission, including the Change Order/CCD Number, and a description of the Work activities, consistent with the descriptions of original Work activities. Contractor shall submit a monthly Change Order/CCD status log to City.
6. If City requires substantiating data, Contractor shall submit information requested by City, with cover letter identifying Project, Application for Payment number and date, and detailed list of enclosures. Contractor shall submit one copy of substantiating data and cover letter for each copy of Application for Payment submitted.
7. If Contractor fails or refuses to participate in monthly Work reconciliations or other construction progress evaluation with City, Contractor shall not receive current payment until Contractor has participated fully in providing construction progress information and schedule update information to City.

C. City's Review of Progress Payment Applications

1. City will review Contractor's Application for Payment following receipt and during the Progress Schedule and Billing Meeting. If adjustments need to be made to percent of completion of each activity, City will make appropriate notations and return to Contractor. Contractor shall revise and resubmit. All parties shall update percentage of completion values in the same manner, i.e., express value of an accumulated percentage of completion to date.
2. If City determines that portions of the Application for Payment are not proper or not due under the Contract Documents, then City may approve the other portions of the Application for Payment, and in the case of disputed items or Defective Work not remedied, may withhold up to 150 percent of the disputed amount from the progress payment.
3. Pursuant to California Public Contract Code §20104.50, if City fails to make any progress payment within 30 calendar days after receipt of an undisputed and properly submitted Application for Payment from Contractor, City shall pay interest to the Contractor equivalent to the legal rates set forth in subdivision (a) of Section 685.010 of the California Code of Civil Procedure. The 30-Day period shall be reduced by the number of calendar days by which City exceeds the seven-Day return requirement set forth herein.
4. As soon as practicable after approval of each Application for Payment for progress payments, City will pay to Contractor in manner provided by law, an amount equal to 95 percent of the amounts otherwise due as provided in the Contract Documents, or a lesser amount if so provided in Contract Documents and by law, provided that payments may at any time be withheld if, in judgment of City, Work is not proceeding in accordance with Contract, or Contractor is not complying with requirements of Contract, or to comply with stop notices or to offset liquidated damages accruing or expected. In City's sole discretion, if Contractor has failed to comply with either its Progress Schedule update or project record documents requirements, City may retain an additional 5% of any earned amounts until such requirements are satisfied.
5. Before any progress payment or final payment is due or made, Contractor shall submit satisfactory evidence that Contractor is not delinquent in payments to employees, Subcontractors, suppliers, or creditors for labor and materials incorporated into Work. This specifically includes, without limitation, conditional lien release forms for the current progress payment and unconditional release forms for past progress payments. This also includes copies of certified payroll from contractor and subcontractors for the current payment period.

D. Payment for Material and Equipment Not Yet Incorporated Into the Work

1. No payment shall be made for materials or equipment not yet incorporated into the Work,

except as specified elsewhere in the Contract Documents or as may be agreed to by City in its sole discretion. Where Contractor requests payment on the basis of materials and equipment not incorporated in the Work, Contractor must satisfy the following conditions:

2. The materials and/or equipment shall be delivered and suitably stored at the Site or at another local location agreed to in writing, for example, a mutually acceptable bonded and insured warehouse.
3. Full title to the materials and/or equipment shall vest in City at the time of delivery to the Site, warehouse or other storage location. Obtain a negotiable warehouse receipt, endorsed over to City for materials and/or equipment stored in an off-site warehouse. No payment will be made until such endorsed receipts are delivered to City.
4. Stockpiled materials and/or equipment shall be available for City inspection, but City shall have no obligation to inspect them and its inspection or failure to inspect shall not relieve Contractor of any obligations under the Contract Documents. Materials and/or equipment shall be segregated and labeled or tagged to identify these specific Contract Documents.
5. After delivery of materials and/or equipment, if any inherent or acquired defects are discovered, defective materials and/or equipment shall be removed and replaced with suitable materials and/or equipment at Contractor's expense.
6. At Contractor's expense, insure the materials and/or equipment against theft, fire, flood, vandalism, and malicious mischief, as well as any other coverages required under the Contract Documents.
7. Contractor's Application for Payment shall be accompanied by a bill of sale, invoice or other documentation warranting that City has received the materials and equipment free and clear of all liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect City interest therein, all of which must be satisfactory to City. This documentation shall include, but not be limited to, conditional releases of mechanics' liens and stop notices from all those providing materials and equipment as to which the Application for Payment relates, as well as unconditional releases of the same from the same as to the previous Application for Payment for which they have not already been provided. Amounts previously paid for materials and equipment prior to incorporation into the Work shall be deducted from amounts otherwise due Contractor as they are incorporated.

1.05 FINAL PAYMENT

A. Final Payment

1. As soon as practicable after all required Work is completed in accordance with Contract Documents, including punchlist, testing, record documents and Contractor maintenance after Final Acceptance, Contractor shall submit its Application for Final Payment.
2. Provided Contractor has met all conditions required for Final payment, City will pay to Contractor, in manner provided by law, unpaid balance of Contract Sum of Work (including, without limitation, retentions), or whole Contract Sum of Work if no progress payment has been made, determined in accordance with terms of Contract Documents, less sums as may be lawfully retained under any provisions of Contract Documents or by law.

B. Final Accounting

1. Prior progress payments and change orders shall be subject to audit and correction in the final payment.
2. Contractor and each assignee under an assignment in effect at time of final payment shall execute and deliver at time of final payment, and as a condition precedent to final payment, Document 00 6530 (Agreement and Release of Claims).

1.06 SUBSTITUTION OF SECURITIES

A. **Public Contract Code Section 22300**. In accordance with the provisions of Public Contract

Code Section 22300, substitution of securities for any moneys withheld under Contract Documents to ensure performance is permitted under following conditions:

1. At request and expense of Contractor, securities listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and City which are equivalent to the amount withheld under retention provisions of Contract shall be deposited with Controller or with a state or federally chartered bank in California, as the escrow agent, who shall then pay such moneys to Contractor. Upon satisfactory completion of Contract, securities shall be returned to Contractor.
2. Alternatively, Contractor may request and City shall make payment of retentions earned directly to the escrow agent at the expense of Contractor. At the expense of Contractor, Contractor may direct the investment of the payments into securities and receive the interest earned on the investments upon the same terms provided for securities deposited by Contractor. Upon satisfactory completion of the work of the Contract Documents, Contractor shall receive from escrow agent all securities, interest, and payments received by the escrow agent from City. Contractor shall then pay to each Subcontractor, not later than 10 calendar days after receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount of retention withheld to insure the performance of Contractor.
3. Contractor shall be beneficial owner of securities substituted for moneys withheld and shall receive any interest thereon.
4. Contractor may enter into an escrow agreement, form included in Contract Documents, as authorized under Public Contract Code Section 22300, specifying amount of securities to be deposited, terms and conditions of conversion to cash in case of default of Contractor, and termination of escrow upon completion of Contract Documents.
5. Public Contract Code Section 22300, in effect on Bid Day, is hereby incorporated in full by this reference and shall supersede anything inconsistent therewith.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 2600

MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes requirements that supplement the paragraphs of Document 00 7200 (General Conditions).

B. Description of procedures for modifying the Contract Documents and determining costs for changes in contract amounts.

1.02 PROCEDURES FOR CONTRACTOR INITIATED CHANGE ORDER

A. Contractor-Initiated Change Proposal Request (CPR) and Procedures:

1. Contractor may initiate changes by submitting a Change Proposal Request ("CPR").
2. Whenever Contractor elects or is entitled to submit a CPR, Contractor shall prepare and submit to City for consideration a CPR using the form included in this Project Manual. All CPRs must contain a complete breakdown of costs of credits, deducts and extras; itemizing materials, labor, taxes, Markup and any requested changes to Contract Time. All Subcontractor Work shall be so indicated. Individual entries on the CPR form shall include applicable Schedule of Values code, with all amounts determined as provided herein. After receipt of a CPR with a detailed breakdown, City will act promptly thereon.
3. If City accepts a CPR, City will prepare a Change Order for City and Contractor signatures.
4. If CPR is not acceptable to City because it does not agree with Contractor's proposed cost and/or time, City will provide comments thereto. Contractor will then, within seven (7) calendar days (except as otherwise provided herein), submit a revised CPR.
5. When necessity to proceed with a change does not allow City sufficient time to conduct a proper check of a CPR (or revised CPR), City may issue a Change Directive (CD) as provided below.

B. Contractor-Initiated Request for Information (RFI) Procedures, Requirements and Limitations:

1. Contractor may submit RFI's for clarifications in City-prepared Contract Documents, which may result in the Contractor submitting a CPR.
2. Whenever Contractor requires information regarding the Project or City-prepared Contract Documents, or receives a request for such information from a Subcontractor, Contractor may prepare and deliver an RFI to City. Contractor shall use RFI format provided on approval by City. Contractor shall not issue an RFI to City solely to clarify Contractor-prepared Construction Documents. Contractor must submit time critical RFIs at least 30 calendar days before scheduled start date of the affected Work activity. Contractor shall reference each RFI to an activity of Progress Schedule and shall note time criticality of the RFI, indicating time within which a response is required. Contractor's failure to reference RFI to an activity on the Progress Schedule and note time criticality on the RFI shall constitute Contractor's waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the RFI.
3. Contractor shall be responsible for its costs to implement and administer RFIs throughout the Contract duration. Regardless of the number of RFIs submitted, Contractor shall not be entitled to additional compensation for the effort required to submit the RFIs. Contractor shall be

responsible for City's administrative costs for answering RFIs where the answer could reasonably be found by reviewing the Contract Documents, as determined by City; at City discretion, such costs may be deducted from progress payments or final payment.

4. City will respond within ten (10) calendar days from receipt of RFI with a written response to Contractor. Contractor shall distribute response to all appropriate Subcontractors.
5. If Contractor is satisfied with the response and does not request a change in Contract Sum or Contract Time, then the response shall be executed without a change.
6. If Contractor believes the response is incomplete, Contractor shall issue another RFI (with the same RFI number with the letter "A" indicating it is a follow-up RFI) to City clarifying original RFI. Additionally, City may return RFI requesting additional information should original RFI be inadequate in describing condition.

C. Time Requirements:

1. If Contractor believes that a City response to an RFI, submittal or other City direction, results in change in Contract Sum or Contract Time, Contractor shall notify City with the issuance of a preliminary CPR within ten calendar days after receiving City's response or direction, and in no event after starting the disputed work or later than the time allowed under Article 12 of Document 00 7200 (General Conditions). If Contractor also requests a time extension, or has issued a notice of delay or otherwise requests a time extension with a CPR, then Contractor shall submit a Time Impact Evaluation (TIE) required herein concurrently with the CPR and in no event later than ten calendar days after providing the notice of delay.
2. If Contractor requires more time to accurately identify the required changes to the Contract Sum or Contract Time, Contractor may submit an updated and final CPR and TIE within 14 calendar days of submitting the preliminary CPR.
3. If City agrees with Contractor's CPR and/or TIE, then City will prepare a Change Order for City and Contractor signatures. If City disagrees with Contractor, then Contractor may give notice of potential claim as provided in Article 12 of Document 00 7200 (General Conditions), and proceed thereunder.
4. Contractor must submit CPRs, notices of potential claim or Claims within the required time periods. Any failure to do so waives Contractor's right to submit a CPR or file a Claim.

D. Cost Estimate Information:

1. Contractor and subcontractors shall, upon City's request, permit inspection of the original unaltered cost estimates, subcontract agreements, purchase orders relating to the change, and documents substantiating all costs associated with its CPR or Claims arising from changes in the Work.

1.03 PROCEDURES FOR CITY INITIATED CHANGE ORDERS

A. City Initiated Change Directives (CD):

1. City may, by Change Directive ("CD") or initially by Instruction Bulletin or by following the procedures for disputed work herein, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, with or without adjustment to Contract Sum or Contract Time.
2. If at any time City believes in good faith that a timely Change Order will not be agreed upon using the foregoing procedures, or at any other time, City may issue a CD with its recommended cost and/or time adjustment (if any). Upon receipt of CD, Contractor shall promptly proceed with the change of Work involved and respond to City within ten (10) calendar days.
3. Contractor's response must be any one of following:
   a. Return CD signed, thereby accepting City response, including adjustment to time and cost (if any).

b. Submit a (revised if applicable) Cost Proposal with supporting documentation (if applicable, reference original Cost Proposal number followed by letter A, B, etc. for each revision), if City so requests.
c. Give notice of intent to submit a claim as described in Article 12 of Document 00 7200 (General Conditions), and submit its claim as provided therein.

4. If CPR or the CD provides for an adjustment to any Contract Sum, the adjustment shall be based on one of the following methods:

a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
b. Contractor to proceed on cost reimbursable (force account) basis while negotiating towards a firm price.
c. Cost to be determined in a manner agreed.

5. Change Directive signed by Contractor indicates the agreement of Contractor therewith, including adjustment in Contract Sum or the method for determining them. Such agreement shall be effective immediately and shall be finalized as a Change Order. Where City authorizes CD work on a time and materials basis up to a maximum amount, then Contractor shall promptly advise City upon reaching 75% of such maximum amount, otherwise Contractor shall accept fully the risk of completing the CD work without exceeding such maximum amount.

6. If Contractor does not respond promptly or disagrees with the method for adjustment (or non-adjustment) in the Contract Sum, the method and the adjustment shall be determined by City on the basis of the Contract Documents and the reasonable expenditures and savings of those performing the Work attributable to the change. If the parties still do not agree on the proper adjustment due to a Change Directive, Contractor may file a Claim per Article 12 of Document 00 7200 (General Conditions) and/or City may direct the changed work through a unilateral change order. Contractor shall keep and present an itemized accounting in a manner consistent with the SOV, together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this paragraph shall be limited to those provided herein.

7. Pending final determination of cost to City, Contractor may include amounts not in dispute in its Applications for Payment. The amount of credit to be allowed by Contractor to City for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by City. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for Markup shall be figured on the basis of net increase, if any, with respect to that change.

B. City Initiated Change Order (CO) or Request for Proposal (RFP):

1. City may initiate changes in the Work or Contract Time by issuing a Request for Proposal ("RFP") or Change Order ("CO") to Contractor.

2. City may issue an RFP to Contractor. Any RFP will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Time from Contractor.

3. In response to an RFP, Contractor shall furnish a Change Proposal Request (CPR) within twenty-one (21) Business Days of City's RFP. Upon approval of CPR, City may issue a Change Directive directing Contractor to proceed with extra Work.

4. If the parties agree on price and time for the work, the City will issue a Contact Change Order. If the parties do not agree on the price or time for a CPR, City may either issue a CD or decide the issue per Article 12 of Document 00 7200 (General Conditions). Contractor shall perform the changed Work notwithstanding any claims or disagreements of any nature.

1.04 PROCEDURES THAT APPLY TO CONTRACTOR- AND CITY-INITIATED CHANGE ORDERS

A. Adjustment of Schedules to Reflect Change Orders or CDs:

1. Contractor shall revise Schedule of Values and Application for Payment forms to record each

authorized Change Order or CD as a separate line item and adjust the Contract Sum as shown thereon prior to the next monthly pay period.

2. Contractor shall revise the Progress Schedules prior to the next monthly pay period, to reflect CO or CD.

3. Contractor shall enter changes in Project Record Documents prior to the next monthly pay period.

B. Required Documentation for Adjustments to Contract Amounts:

1. For all changes and cost adjustments requested, Contractor shall provide documentation of change in Contract Amounts asserted, with sufficient data to allow evaluation of the proposal.

2. In all requests for compensation, cost proposals, estimates, claims and any other calculation of costs made under the Contract Documents, Contractor shall breakout and quantify costs of labor, equipment and materials identified herein, for Contractor and subcontractors of any tier.

3. Contractor shall, on request, provide additional data to support computations for:

   a. Quantities of products, materials, labor and equipment.
   b. Taxes, insurance, and bonds.
   c. Justification for any change in Contract Time and new Progress Schedule showing revision due, if any.
   d. Credit for deletions from Contract, similarly documented.

4. Contractor shall support each claim or computation for additional cost, with additional information including:

   a. Origin and date of claim or request for additional compensation.
   b. Dates and times Work was performed and by whom.
   c. Time records and wage rates paid.
   d. Invoices and receipts for products, materials, equipment and subcontracts, similarly documented.
   e. Credit for deletions from Contract, similarly documented.

C. Responses and Disputes:

1. For all responses for which the Contract Documents do not provide a specific time period, recipients shall respond within a reasonable time.

2. For all disputes arising from the procedures herein, Contractor shall follow Article 12 of Document 00 7200 (General Conditions).

1.05 COST DETERMINATION FOR CHANGES IN CONTRACT AMOUNTS

A. Calculation of Total Cost of Extra Work:

1. Total cost of changed Work, extra Work or of Work omitted shall be the sum of three components defined immediately below as: Component 1 (Direct Cost(s)); Component 2 (Markup); and, Component 3 (bonds, insurance, taxes)

2. Component 1: Direct Cost(s) of labor, equipment and materials, is calculated based upon actually incurred (or omitted) labor costs, material costs and equipment rental costs, as defined herein;

3. Component 2: Markup on such actually incurred Direct Costs, is applied in the percentages identified below; and

4. Component 3: Actual additional costs for any additionally required insurance, bonds, and/or taxes, defined herein, is calculated without Markup.

1.06 MEASUREMENT OF DIRECT COST OF CONSTRUCTION (COST COMPONENT NO. 1)

A. Composition of Component 1 (Direct Cost of Construction):

1. Component 1 has four subcomponents, also referred to as “LEMS”:

   a. Labor (Component 1A)
   b. Equipment (Component 1B)
   c. Materials (Component 1C)
   d. Subcontractors (Component 1D)

B. Measurement of Cost of Labor (Component 1A):

1. Cost of Labor shall be calculated as: Cost of labor for workers (including forepersons when authorized by City) used in actual and direct performance of the subject work, whether employer is Contractor, Subcontractor or other forces, in the sum of the following:

   a. Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation, and similar purposes.
   b. Labor surcharge: Payments imposed by local, county, state, and federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages as defined, such as worker’s compensation insurance. Such labor surcharge shall not exceed generally accepted standards in the State for labor rates in effect on date upon which extra Work is accomplished.
   c. Cost of labor shall include no other costs, fees or charges.

2. Labor cost for operators of equipment owned and operated by Contractor or any Subcontractor, shall be no more than rates of such labor established by collective bargaining agreements for type of worker and location of Work, whether or not owner-operator (i.e., Contractor or Subcontractor) is actually covered by such an agreement.

3. Cost of labor shall be recorded and documented in certified payroll records, maintained in the form customary and/or required in the State, delivered to City weekly.

C. Measurement of Cost of Equipment (Component 1B):

1. Measurement of Component 1B (Cost of Equipment). Cost of Equipment shall be calculated as: Cost of Equipment used in actual and direct performance of the subject work, whether by Contractor, Subcontractor or other forces. Cost of Equipment shall be calculated as herein described.

2. For rented equipment, cost will be based on actual rental invoices, appropriate for the use and duration of the work. Equipment used on extra Work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type, as determined by City.

3. Equipment rental cost for Contractor or Subcontractor-owned equipment, shall be determined by reference to, and not in excess of, the generally accepted standards in the State for equipment rental rates in effect on date upon which extra Work is accomplished. If there is no applicable rate for an item of equipment, then payment shall be made for Contractor- or Subcontractor-owned equipment at rental rate listed in the most recent edition of the CalTrans Standard Schedules and Specifications, and absent a rental rate therein, then the Association of Equipment Distributors (AED) book.

4. In all cases, rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

5. Unless otherwise specified, manufacturer’s ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a replacement value of $100 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.

6. For equipment on Site, rental time to be paid for equipment shall be time equipment is in

operation on extra Work being performed or on standby as approved by City. The following shall be used in computing rental time of equipment:

a. When hourly rates are listed, less than 30 minutes of operation shall be considered to be ½ hour of operation.
b. When daily rates are listed, less than four hours of operation shall be considered to be ½ Day of operation.
c. Rates shall correspond to actual rates paid by Contractor, i.e., if Contractor pays lower weekly or monthly rates, then same shall be charged to City.

7. For equipment that must be brought to Site to be used exclusively on extra Work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:

a. City will pay for costs of loading and unloading equipment.
b. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
c. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission or appropriate State Dept. of Transportation.
d. City will not make any payment for transporting and loading and unloading equipment if equipment is used on Work in any other way than upon extra Work.
e. Rental period may begin at time equipment is unloaded at Site of extra Work and terminate at end of the performance of the extra Work or Day on which City directs Contractor to discontinue use of equipment, whichever first occurs. Excluding Saturdays, Sundays, and City legal holidays, unless equipment is used to perform extra Work on such Days, rental time to be paid per Day shall be four hours for zero hours of operation, six hours for four hours of operation and eight hours for eight hours of operation, time being prorated between these parameters. Hours to be paid for equipment that is operated less than eight hours due to breakdowns, shall not exceed eight less number of hours equipment is inoperative due to breakdowns.

8. Employee vehicles are not part of Component 1A, rather, are included within Component 2 (Markup).

9. Equipment costs shall include no other costs, fees or charges.

D. Measurement of Cost of Material (Component 1C):

1. Cost of Material shall be calculated as herein described. Cost of such materials will be cost to purchaser (Contractor, Subcontractor or other forces) from supplier thereof, except as the following are applicable:

2. If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to City notwithstanding fact that such discount may not have been taken.

3. For materials salvaged upon completion of Work, salvage value of materials shall be deducted from cost, less discounts, of materials.

4. If cost of a material is, in opinion of City, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in this Paragraph.

5. Material costs shall include no other costs, fees or charges.

E. Measurement of Cost of Subcontractors (Component 1D):

1. Where reimbursed or calculated per the terms of the Contract Documents, change order or Change Directive, cost of Subcontractors shall be calculated as amounts earned by Subcontractors procured in compliance with the Contract Documents and approved by the City, provided such subcontractor earned amounts meet the following requirements:

a. Such amounts are earned under the terms of the Subcontracts and the Work complies with the terms of the Contract Documents;

b. Such amounts are properly requested, documented and permitted under the terms of the subcontract(s) and the Contract Documents.
c. Total cost to City of Direct Costs of Construction (labor, equipment, materials), Markup, and costs of bonds, insurance and taxes, conform to contract limitations (i.e., totals paid by City do not exceed the 20% Markup limitation.).

1.07 MEASUREMENT AND PAYMENT OF MARK UP (COST COMPONENT 2)

A. Markup Percentages for Changed Work (Component 2):

1. Markup on Direct Cost of labor and materials for extra Work shall be 15%. Markup on Direct Cost of equipment for extra Work shall be 15%.

2. When extra Work is performed by Subcontractors, regardless of the number of tiers, total Markup on "Component 1" Direct Costs shall not exceed 20%. Contractor and its Subcontractors shall divide the 20% as they may agree.

3. Under no circumstances shall the total Markup on any extra Work exceed twenty (20) percent, stated as a percent of the Direct Cost of labor, equipment and materials. This limitation shall apply regardless of the actual number of subcontract tiers.

4. On proposals covering both increases and decreases in Contract Sum, Markup shall be allowed on the net increase only as determined above. When the net difference is a deletion, no percentage for Markup shall be allowed, but rather an appropriate percentage deduction shall be issued in the amount of the net difference.

B. Measurement and Payment of Mark Up (Component 2):

1. Mark Up (Component 2) provides complete compensation to Contractor for:

a. All Contractor profit;
b. All Contractor home-office overhead;
c. All Contractor assumption of risk assigned to Contractor under the Contract Documents;
d. Subject to the qualifications below regarding self-performed work, all General Conditions and General Requirements.

2. Profit. Compensation for profit included within Component 2 (Mark Up), includes without limitation: Fees of all types, nature and description; and Profit and margins of all types, nature and description.

3. Home Office Expenses. Compensation for home office expenses included within Component 2 (Mark Up), includes without limitation: Salaries and other compensation of any type of Contractor's personnel (management, administrative and clerical), and all direct and indirect operating, travel, payroll, safety, storage, quality control, maintenance and overhead costs of any nature whatsoever, incurred by Contractor at any location other than the Project specific site office, including without limitation, Contractor's principal or branch offices; insurance premiums other than those for Project specific insurance directed by the City in a change order; all hardware, software, supplies and support personnel necessary or convenient for Contractor's capture, documentation and maintenance of its costs and cost accounting data and cost accounting and control systems and work progress reporting.

4. Assumption of Risk. Compensation for Contractor's assumption of risk under the Contract Documents, included within Component 2 (Mark Up), includes without limitation loss, cost, damage, expense or liability resulting directly or indirectly from any of the following causes ("unallowable costs"), for Contractor and subcontractors of any tier: noncompliance with the Contract Documents, fault or negligence, defective or non-conforming Work, by Contractor or any Subcontractor or Vendor of any tier or anyone directly or indirectly employed by any of them, or for whose acts or omissions any of them are responsible or liable at law or under the Contract Documents; cost overruns of any type; costs in excess of any lump sum, not to exceed amount or GMP; costs resulting from bid or "buy out" errors, unallocated scope, or incomplete transfer of scope or contract terms to subcontractors; any costs incurred by Contractor relating to a Change in the Work without a Change Order or Change Directive in accordance with the

Contract Documents; costs for work or materials for which no price is fixed in the Contract Documents, unless it is expressly specified that such work or material is to be paid for as extra work.

5. General Conditions and Division 1 General Requirements. Compensation for Contractor's General Conditions and General Requirements Costs included within Component 2 (Mark Up), includes compensation to Contractor for: Contractor's direct costs, without overhead or profit, for salaries and related forms of compensation and employer's costs for labor and personnel costs, of Contractor's employees and subconsultant's employees (if any), while and only to the extent they are performing Work at the Project Site. Personnel and Work compensated by this Component include without limitation: All required Project management responsibilities; all on-site services; monthly reporting and scheduling; routine field inspection of Work; general superintendence; general administration and preparation of cost proposals, schedule analysis, change orders and other supporting documentation as necessary; salaries of project superintendent, project engineers, project managers, safety manager, other manager, timekeeper, and secretaries; all cost estimates and updates thereto; development, validation and updates to the project schedule; surveying; estimating. Compensation for Contractor's General Requirements Costs included within Component 2 (Mark Up), compensates Contractor for its "General Requirements" Costs, including without limitation: all scheduling hardware, software, licenses, equipment, materials and supplies; purchase, lease or rental, build out, procurement, supporting equipment and maintenance of temporary on-Site facilities, Project field and office trailers and other temporary facilities, office equipment and supporting utilities; platforms, fencing, cleanup and jobsite security; temporary roads, parking areas, temporary security or safety fencing and barricades, etc.; all Contractor's motor vehicles used by any Contractor's personnel, and all costs thereof; all health and safety requirements, required by law or City procedures; all surveying; all protection of Work; handling and disposal fees; final cleanup; repair or maintenance; other incidental Work; all items, activities and function similar to any of those described above; all travel, entertainment, lodging, board and the like.

6. Personnel compensated by the Markup Component do not include workers of foreman level or below in the case of self-performed work; rather, such personnel shall be treated as a Direct Cost of Construction. Costs compensated by the Markup component do not include temporary measures specifically required by the changed work, not otherwise required or ongoing in the prosecution of the Work, that commence specifically to support the changed work and conclude with the completion of the changed work. Such costs shall be treated as Direct Costs of Construction. Examples of General Requirements costs that this component may not cover are the following: temporary barricades or fencing of specific areas required specifically for the changed work; cranes required specifically for the changed work; extra security required specifically for the changed work.

1.08 MEASUREMENT AND PAYMENT OF BONDS INSURANCE TAXES (COMPONENT 3)

A. Measurement of Bonds, Insurance, Taxes (Component 3):

1. Component 3 (Bonds, Insurance, Taxes) consists of the cost of bonds, insurance and taxes, also referred to as **"BIT".** All State sales and use taxes, applicable County and applicable City sales taxes, shall be included. Federal and Excise tax shall not be included.

2. There is no mark up on BIT.

1.09 EFFECT OF PAYMENT

A. Change Order Compensation is All Inclusive.

1. Except as provided expressly below regarding changes that extend the Contract Time, payment of calculated cost of extra work constitutes full and complete compensation for costs or expense arising from the extra Work, and is intended to be all inclusive.

2. Payment for Direct Cost of Construction (Component 1 or LEMS) is intended to be all-inclusive. Any costs or risks not delineated within cost of labor, equipment or materials herein, shall be deemed to be within the costs and risks encompassed by the applicable Markups and

unallowable in any separate amount.

3. Payment of Markup (Component 2) is intended to be all-inclusive. Contractor waives claims for any further or different payment of cost and risk items delineated herein, other than the allowable percentage markup on costs set forth in the Contract Documents; such separate, further or different cost or risk items shall be unallowable, waived and liquidated within the allowable percentage markup.
4. Contractor shall recover no other costs or markups on extra work of any type, nature or description.

B. Exception for Changes Extending the Contract Time.

1. Where a change in the Work extends the Contract Time, Contractor may request and recover additional, actual direct costs, provided Contractor can demonstrate such additional costs are (i.) actually incurred performing the Work, (ii.) not compensated by the Markup allowed, and (iii) directly result from the extended Contract Time. Contractor shall make such request and provide such documentation following all required procedures, documentation and time requirements in the Contract Documents, and subject to all contract limitations of liability. Contractor may not seek or recover such costs using formulas (e.g., Eichleay).

C. Limits of Liability / Accord and Satisfaction.

1. The foregoing limits of compensation apply in all cases of claims for changed Work, whether calculating Change Proposal Requests, Change Orders or CDs, or calculating claims and/or damages of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including strict liability or negligence. Contractor may recover no other costs arising out of or connected with the performance of extra Work, of any nature.
2. Under no circumstances may Contractor claim or recover special, incidental or consequential damages against City, its representatives or agents, whether arising from breach of contract, negligence, strict liability or other tort or legal theory, unless specifically and expressly authorized in the Contract Documents.
3. No change in Work shall be considered a waiver of any other condition of Contract Documents. No claim shall be made for anticipated profit, for loss of profit, for damages, or for extra payment whatever, except as expressly provided for in Contract Documents.
4. Accord and Satisfaction: Every Change Order and accepted CD shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay and any other type of claim. Contractor may elect to reserve its rights to disputed claims arising from or relating to the changed Work at the time it signs a Change Order or approves a CD, but must do so expressly in a writing delivered concurrently with the executed Change Order or approved CD, and must also submit a Claim for the reserved disputed items pursuant to Article 12 of Document 00 7200 (General Conditions) no later than thirty (30) calendar days after Contractor's first written notice of its intent to reserve rights. Execution of any Change Order or CD shall constitute Contractor's representation of its agreement with this provision.

1.10 MISCELLANEOUS REQUIREMENTS

A. City-Furnished Materials.

1. City reserves right to furnish materials as it deems advisable, and Contractor shall have no claims for costs and Markup on such materials.

B. Records And Certification.

1. All charges shall be recorded daily and summarized in Change Proposal Request form attached hereto. Contractor or authorized representative shall complete and sign form each day. Contractor shall also provide with the form: the names and classifications of workers and hours worked by each; an itemization of all materials used; and a list by size type and identification

number of equipment and hours operated.

2. City shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor's claims for modification of Contract, including CD Work. This right shall be specifically enforceable, and any failure of Contractor to voluntarily comply shall be deemed an irrevocable waiver and release of all claims then pending that were or could have been subject to Article 12 of Document 00 7200 (General Conditions).

C.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

[COST PROPOSAL FORM FOLLOWS ON NEXT PAGE]

COST PROPOSAL (CP)

Owner **West Berkeley Service Center Improvement Project**
Contract Number _____

CP Number: _____
Date: _____
In Response To _____
RFP #, etc.

To: City of Berkeley
Attention: **Titus Chen**
1947 Center Street, 5th Floor
Berkeley, CA 94704
Phone: (510) 981-6400
Fax: (510) 981-6390

From: [Insert Contractor's Name/Address]
_____
_____

This Cost Proposal is in response to the above-referenced _____ **[insert RFP, etc. as applicable]**.
Brief description of change(s): _____
_____

ITEM DESCRIPTION	PRIME CONTRACTOR	SUB 1	SUB 2	SUB 3	SUB 4	TOTAL
MATERIAL						
LABOR						
EQUIPMENT						
Other (Specify) Extended Overhead						
TOTAL COST						
Subcontractor's Overhead & Profit 15 percent						
Contractor's Overhead & Profit 15 percent						
Overhead & Profit to Contractor for Subcontractor's Work 5 percent						
(percent of Total Cost above not including any Overhead & Profit – may not exceed 20%)						
GRAND TOTAL						
REQUESTED CHANGE IN CONTRACT TIME (CALENDAR DAYS) (Time Impact Evaluation Enclosed)						

_____
By Contractor: Signature: Date:

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 3119

PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Summary

1. Section includes description of required project meetings.

1.02 PRECONSTRUCTION CONFERENCE

A. Preconstruction Conference. City will call for and administer Preconstruction Conference at time and place to be announced (usually the week prior to start of Work at the Site). Contractor, all major Subcontractors, and major suppliers shall attend Preconstruction Conference. Agenda may include, but not be limited to, the following items:

1. Schedules
2. Personnel and vehicle permit procedures
3. Use of premises
4. Location of the Contractor's on-Site facilities & Temporary Utilities
5. Security
6. Housekeeping
7. Submittal and RFI procedures
8. Inspection and testing procedures, on-Site and off-Site
9. Utility shutdown procedures
10. Control and reference point survey procedures
11. Injury and Illness Prevention Program
12. Contractor's Initial Progress Schedule
13. Contractor's Schedule of Values
14. Contractor's Schedule of Submittals
15. Jurisdictional agency requirements
16. Project Communication Procedures
17. Modification Procedures
18. Site Access by City and Consultants
19. As-Built/Record Documents
20. Permits & Fees
21. Coordination: (Work Performed for City under separate contract). (As Appropriate)
22. City will distribute copies of minutes to attendees. Attendees shall have 7 calendar days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of Preconstruction Conference.

1.03 WEEKLY PROJECT MEETINGS

A. City will schedule and administer weekly progress meetings throughout duration of Work. Progress meetings will be held weekly unless otherwise directed by City. Meetings shall be held at City's Offices unless otherwise specified in Contract Documents.

1. City's Representative will prepare agenda and distribute it 4 calendar days in advance of meeting to Contractor.
2. Participants with agenda items shall present them.
3. The Architect/Engineer and other responsible entities shall attend meetings unless otherwise

specified in Contract Documents or provided by City.

4. City shall record and distribute the meeting minutes. Minutes shall be distributed by the City to the Contractor within 3 business days after the meeting. Contractor shall distribute the minutes to those affected by decisions made at meeting. Attendees shall have five business days to submit comments or additions to the minutes. Minutes shall constitute final memorialization of results of meeting.
5. Progress meetings shall be attended by Contractor's job superintendent, major Subcontractors and suppliers, City, and others as appropriate to agenda topics for each meeting.
6. Agenda may contain the following items, as appropriate:
   a. Review, revise as necessary, and approve previous meeting minutes
   b. Review of Work progress since last meeting
   c. Status of Construction Work Schedule, delivery schedules, adjustments
   d. Submittal, RFI, and Change Order status
   e. Review of the Contractor's safety program activities and results, including report on all serious injury and/or damage accidents
   f. Other items affecting progress of Work

1.04 PROGRESS SCHEDULE AND BILLING MEETINGS

A. A meeting will be held on approximately the 20th of each month to review the schedule update submittal and progress payment application.

B. At this meeting, at a minimum, the following items will be reviewed:

1. Percent complete of each activity;
2. Time impact evaluations for Change Orders and Time Extension Request;
3. Actual and anticipated activity sequence changes;
4. Actual and anticipated duration changes; and
5. Actual and anticipated Contractor delays.
6. Waste Management Tracking/Tags
7. As-Built/Record Documents

C. These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, Contractor's General Superintendent and Scheduler shall attend these meetings.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 3230

PROGRESS SCHEDULES AND SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes description of requirements and procedures for submitting progress schedules and submittals.

1.02 CONTRACTOR TO SUBMIT PROGRESS SCHEDULES

A. Contractor shall submit original (baseline) progress schedule two weeks prior to the first Application for Payment.

B. Baseline Progress Schedule shall show Contractor's construction and procurement activities, including but not limited to, equipment procurement and delivery (Contractor and City supplied), activities with Subcontractors and suppliers, major submittal reviews, commissioning of systems, use of major equipment on site, and necessary interface with City and third parties required to complete the Work in a timely manner and in accordance with Contract Time.

1.03 SCHEDULE REQUIREMENTS.

A. Unless City agrees in writing otherwise, progress schedule shall be on Microsoft Project, Primavera P6, Suretrack, or equivalent software, as City may specify, which Contractor shall prepare and supply to City, with all datapoint entries completed for start dates, necessary work activities, durations (not longer than 21 calendar days) and logic ties.

B. Contractor's progress schedule may be in the form of a CPM (arrow) diagram or, if City agrees in writing, a bar chart or a Gantt chart. The hard copies of the schedule supplied to City shall indicate the critical path of the Work (in red) and shall show a logical progression of the Work through completion within Contract Time.

C. Unless City agrees in writing otherwise, progress schedule shall also show early and late start and finish dates and total available float (float to the successor activity's late start date) for each activity. City has no obligation to accept an early completion schedule.

1.04 MONTHLY UPDATES

A. Contractor's progress schedule shall be updated monthly to reflect actual progress. The schedule shall be subject to City's review and acceptance for use in monitoring Contractor's Work and evaluating Applications for Payment.

B. Contractor shall supply City with an electronic copy of the updated progress schedule with each monthly payment application. Contractor shall provide City with **three-week** look ahead schedules weekly, showing in detail and activities and resources scheduled for the immediate two week period.

1.05 RECOVERY SCHEDULE

A. City may request a recovery schedule should Contractor fall 21 or more calendar days behind any schedule Milestone, which schedule shall show Contractor's plan and resources committed to retain Contract completion dates.

B. The recovery schedule shall show the intended critical path. If City requests, Contractor shall also:

1. Secure and demonstrate appropriate Subcontractor and supplier consent to the recovery

Schedule.

2. Submit a narrative explaining trade flow and construction flow changes and man-hour loading assumptions for major Work activities and/or Subcontractors.

1.06 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, TIME EXTENSIONS AND DELAYS:

A. When Contractor requests a time extension for any reason, Contractor shall submit a TIE that includes both a written narrative and a schedule diagram depicting how the changed Work or other impact affects other schedule activities. The schedule diagram shall show how Contractor proposes to incorporate the changed Work or other impact in the schedule and how it impacts the current Schedule update critical path or otherwise. Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram shall be tied to the main sequence of scheduled activities to enable City to evaluate the impact of changed Work to the scheduled critical path.

B. Contractor is responsible for all costs associated with the preparation of TIE's, and the process of incorporating TIE's into the current schedule update. Provide City with four copies of each TIE.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 3300

SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes description of requirements and procedures for submittals.

1.02 SCHEDULE OF SUBMITTALS

A. Contractor shall prepare for City's review and acceptance prior to commencement of work on the Site, for purposes of contract administration, a schedule of submittals (also referred to as a submittal register) required to complete the Work, prepared by Contractor and accepted by City for contract administration. Schedule of submittals shall include, for each submittal: the specification or drawing reference requiring the submittal, if applicable; the material, item, or process for which the submittal is required; the submittal number and identifying title of the submittal; the Contractor's anticipated submission date and the approval need date.

B. Contractor shall update monthly the schedule of submittals to reflect actual submission and acceptance dates for submittals. Review by City of schedule of submittals does not excuse Contractor of obligation to supply, schedule and coordinate all submittals required by the Contract Documents.

1.03 CONTRACTOR TO SUBMIT SHOP DRAWINGS, PRODUCT DATA AND SUBMITTALS.

A. Contractor shall review for compliance with Contract Documents, approve and submit to City Shop Drawings, Product Data, Samples and similar submittals required by Contract Documents.

B. Contractor shall schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Contractor shall include certifications to be submitted with the pertinent drawings at the same time.

C. Contractor shall coordinate scheduling, sequencing, preparing and processing of all submittals with performance of work so that work will not be delayed by submittal processing.

D. Submittals shall specifically identify any Work depicted that does not conform to the Contract Documents.

1.04 CITY REVIEW OF SHOP DRAWINGS, PRODUCT DATA AND SUBMITTALS.

A. After review by City of each Submittal, material will be returned to Contractor with actions defined as follows:

1. NO EXCEPTIONS TAKEN - Accepted subject to its compatibility with general design concept of the Work, future Submittals and additional partial Submittals for any portions of the Work not covered in this Submittal. Does not constitute acceptance or deletion of specified or required items not shown on the Submittal.
2. MAKE CORRECTIONS NOTED (NO RESUBMISSIONS REQUIRED) - Same as item 1 above, except that minor corrections as noted shall be made by Contractor.
3. REVISE AS NOTED AND RESUBMIT - Rejected because of major inconsistencies or errors that shall be resolved or corrected by Contractor prior to subsequent review by City.
4. REJECTED - RESUBMIT - Submitted material does not conform to Drawings and/or Specifications in major respect, i.e.: wrong size, model, capacity, or material.

B. Favorable review will not constitute acceptance by City of any responsibility for the accuracy, coordination, or completeness of the Submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to back-check comments, corrections, and modifications from City's review before fabrication. Contractor, Subcontractors, or suppliers may prepare Submittals, but Contractor shall ascertain that Submittals meet requirements of Contract Documents, while conforming to structural space and access conditions at point of installation. City's review will be only to assess if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as indicated by the Contract Documents. Favorable review of Submittal, method of Work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by City, or any officer or employee thereof, and Contractor shall have no claim under Contract Documents on account of failure or partial failure or inefficiency or insufficiency of any plan or method of Work or material and equipment so accepted. Favorable review shall be considered to mean merely that City has no objection to Contractor using, upon Contractor's own full responsibility, plan or method of Work proposed, or furnishing materials and equipment proposed.

C. Unless otherwise specified, City's review will not extend to the means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

D. Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been favorably reviewed by the City; otherwise, any such Work is at Contractor's sole risk.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 4100

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Regulatory requirements applicable to Contract Documents
2. Required provisions under Local Agency Disputes Act
3. Required references under federal law

1.02 GENERAL

A. Compliance with Laws

1. Conform to all applicable codes, laws, ordinances, rules and regulations, which shall have full force and effect as though printed in full in these Specifications. Codes, laws, ordinances, rules, regulations and ordinances (**Regulatory Requirements**) are not furnished to Contractor, because Contractor is assumed to be familiar with these requirements.
2. Any listing of Regulatory Requirements for hazardous waste abatement Work in the Contract Documents is supplied to Contractor as a courtesy and shall not limit Contractor's responsibility for complying with all applicable Regulatory Requirements having application to the Work. Where conflict among the Regulatory Requirements or with these Specifications occurs, the most stringent requirements shall be used.
3. Specific reference in the Specifications to codes and regulations or requirements of regulatory agencies shall mean the latest printed edition of each adopted by the regulatory agency in effect at the time of the opening of Bids, except as may be otherwise specifically stated in the Contract Documents.

B. Precedence

1. Where specified requirements differ from Regulatory Requirements, the more stringent requirements shall take precedence. Where Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by Regulatory Requirements, then Drawings and Specifications shall take precedence so long as such increase is legal. Where no requirements are identified on Drawings or in Specifications, comply with all Regulatory Requirements of governing authorities having jurisdiction.
2. Should any conditions develop not covered by the Contract Documents wherein the finished Work will not comply with current codes, a Change Order detailing and specifying the required Work shall be submitted to and approved by City before proceeding with the Work.

1.03 REGULATORY REQUIREMENTS

A. Applicable Codes

1. Codes that apply to Contract Documents include all Codes applicable to construction, including, but not limited to, the following:
   a. California Building Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.

b. California Electrical Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
c. California Plumbing Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for plumbing, sewage disposal and health requirements.
d. California Mechanical Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
e. California Energy Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
f. California Green Building Standard Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
g. International Fire Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
h. California Administrative Code Titles 15, 19 and 24 (with California amendments), and Americans with Disabilities Act (ADA) accessibility guidelines, whichever is more stringent.
i. All State laws and City and County Ordinances, rules of the State or City or County Health Departments, rules of the National Board of Fire Underwriters and National Fire Protection Associations, and local power company regulations for mechanical and electrical work.

B. Applicable Laws, Statutes, Ordinances, Rules, And Regulations

1. During prosecution of Work to be done under Contract Documents, Contractor shall comply with applicable laws, ordinances, rules and regulations, including, but not limited to, the following:

a. Federal:
   1) Americans With Disabilities Act of 1990
   2) 29 CFR, Section 1910.1001, Asbestos
   3) 40 CFR, Subpart M, National Emission Standards for Asbestos
   4) Executive Order 11246
   5) Federal Endangered Species Act
   6) Clean Water Act
b. State of California:
   1) California Code of Regulations, Titles 5, 8, 17, 19, 21, 22, 24 and 25
   2) California Public Contract Code
   3) California Health and Safety Code
   4) California Government Code
   5) California Labor Code
   6) California Civil Code
   7) California Code of Civil Procedure
   8) CPUC General Order 95, Rules for Overhead Electric Line Construction
   9) CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems
   10) Cal/OSHA
   11) OSHA: Hazard Communications Standards
   12) California Endangered Species Act
   13) Water Code
   14) Fish and Game Code
c. State of California Agencies:
   1) State and Consumer Services Agency
   2) Office of the State Fire Marshall
   3) Office of Statewide Health Planning and Development
   4) Department of Fish and Game
   5) All Air Quality Management Districts with jurisdiction
   6) All Regional Water Quality Control Boards with jurisdiction
   7) Division of the State Architect (if having jurisdiction)
d. All Local Agencies with jurisdiction (cities, counties, fire departments)

C. Change Orders and Claims:

1. The California Public Contract Code, including but not limited to Section 7105(d)(2), and the California Government Code Section 930.2 et seq., apply to all contract procedures for changes, time extensions, change orders (time or compensation) and claims. Federal law (U.S. v. Holpuch 326 U.S. 234) shall supplement California law on the enforceability of these requirements.
2. Any change, waiver, or omission to implement contract change order and claim procedures shall have no legal effect unless expressly permitted in a fully executed change order approved by Contractor and City and approved as to form by their respective legal counsel.

D. Required Provisions On Contract Claim Resolution

1. The California Public Contract Code specifies required provisions on resolving contract claims less than $375,000, which are set forth below, and constitute a part of this Contract.
2. For the purposes of this section, “Claim” means a separate demand by Contractor of $375,000 or less for (1) a time extension, (2) payment or money or damages arising from Work done by or on behalf of Contractor arising under the Contract Documents and payment of which is not otherwise expressly provided for or the Claimant is not otherwise entitled to, or (3) an amount the payment of which is disputed by City. In order to qualify as a Claim, the written demand must state that it is a Claim submitted under paragraph 12 of Document 00 7200 (General Conditions) and be submitted in compliance with all requirements of Document 00 7200 (General Conditions), paragraph 12. Separate Claims which total more than $375,000 do not qualify as a “separate demand of $375,000 or less,” as referenced above, and are not subject to this section.
3. A voucher, invoice, payment application, or other routine or authorized form of request for payment is not a Claim for purposes of this section. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a Claim under this section by submitting a separate claim in compliance with Contract Documents claim submission requirements.
4. Caution. This section does not apply to tort claims and nothing in this section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 and Chapter 2 of Part 3 of Division 3.6 of Title 1 of the California Government Code.
5. Procedure:
   a. The Claim must be in writing, submitted in compliance with all requirements of Document 00 7200 (General Conditions), paragraph 12, including, but not limited to, the time prescribed by and including the documents necessary to substantiate the Claim, pursuant to Document 00 7200 (General Conditions), paragraph 12.3. Claims must be filed on or before the day of final payment. Nothing in this section is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth in Document 00 7200 (General Conditions), paragraph 12 or elsewhere in the Contract Documents.
   b. For Claims of fifty thousand dollars ($50,000) or less, City shall respond in writing within forty-five (45) calendar days of receipt of the Claim, or City may request in writing within thirty (30) calendar days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims City may have against Claimant. If additional information is thereafter required, it shall be requested and provided in accordance with this section upon mutual agreement of City and Claimant. City’s written response to the Claim, as further documented, shall be submitted to Claimant within fifteen (15) calendar days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.
   c. For Claims over Fifty Thousand Dollars ($50,000) and less than or equal to $375,000: City shall respond in writing within sixty (60) calendar days of receipt of the Claim, or City may request in writing within thirty (30) calendar days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims City may have against Claimant. If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of City and Claimant;

City's written response to the Claim, as further documented, shall be submitted to Claimant within thirty (30) calendar days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.

d. Meet and Confer: If Claimant disputes City's written response, or City fails to respond within the time prescribed above, Claimant shall notify City, in writing, either within fifteen (15) calendar days of receipt of City's response or within fifteen (15) calendar days of City's failure to timely respond, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon demand City will schedule a meet and confer conference within thirty (30) calendar days for settlement of the dispute.

e. Following the meet and confer conference, if the Claim or any portion remains in dispute, Claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the California Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time Claimant submits its written claim as set forth herein, until the time that Claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

E. Compliance With Americans With Disabilities Act

1. Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services and other activities provided by a public entity to the public, whether directly or through a Contractor, must be accessible to the disabled public. Contractor shall provide the services specified in the Contract Documents in a manner that complies with the ADA and any and all other applicable federal, state and local disability rights legislation. Contractor agrees not to discriminate against disabled persons in the provision of services, benefits or activities provided under the Contract Documents and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents or assigns shall constitute a material breach of the Contract Documents.

F. Compliance With IRCA

1. Contractor acknowledges that Contractor, and all subcontractors hired by Contractor to perform services under this Agreement, are aware of and understand the immigration Reform and Control Act ("IRCA"). Contractor is and shall remain in compliance with the IRCA and shall ensure that any subcontractors hired by Contractor to perform services under this Agreement are in compliance with the IRCA. In addition, Contractor agrees to indemnify, defend and hold harmless City, its agents, officers and employees, from any liability, damages or causes of action arising out of or relating to any claims that Contractor's employees, or employees of any subcontractor hired by Contractor, are not authorized to work in the United States for Contractor or its subcontractor and/or any other claims based upon alleged IRCA violations committed by Contractor or Contractor's subcontractors.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 4200

REFERENCES AND DEFINITIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Reference standards, abbreviations, symbols, and definitions used in Contract Documents.
2. Full titles are given in this Section for standards cited in other Sections of Specifications.

1.02 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES; REPORTING AND RESOLVING DISCREPANCIES

A. References

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.
2. If during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such law or regulation applicable to the performance of the Work or of any such standard, specification, manual, or code or of any instruction of any supplier, Contractor shall report it in writing at once to City's Representative and Architect/Engineer, and Contractor shall not proceed with the Work affected thereby until consent to do so is given by City.

B. Precedence

1. Except as otherwise specifically stated in the Contract Documents or as may be provided by Change Order, CCD, or Supplemental Instruction, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
   a. The provisions of any such standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
   b. The provisions of any such laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).
2. No provision of any such standard, specification, manual, code, or instruction shall be effective to change the duties and responsibilities of City, City's Representative, Architect/Engineer or Contractor, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to City, Architect/Engineer, or any of their consultants, agents, representatives or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

C. Referenced Grades, Classes, and Types:

1. Where an alternative or optional grade, class, or type of product or execution is included in a reference but is not identified in Drawings or in Specifications, provide the highest, best, and

greatest of the alternatives or options for the intended use and prevailing conditions.

D. Edition Date of References:

1. When an edition or effective date of a reference is not given, it shall be understood to be the current edition or latest revision published as of the date of opening Bids.
2. All amendments, changes, errata and supplements as of the effective date shall be included.

E. **ASTM and ANSI References:** Specifications and Standards of the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI) are identified in the Drawings and Specifications by abbreviation and number only and may not be further identified by title, date, revision, or amendment. It is presumed that Contractor is familiar with and has access to these nationally- and industry-recognized specifications and standards.

1.03 DEFINITIONS

A. Meaning of Words and Phrases

Wherever any of the words or phrases defined below, or a pronoun used in place thereof, is used in any part of the Contract Documents, it shall have the meaning here set forth. Where abbreviations and symbols are used, such abbreviations and symbols shall be given their common meaning in the construction industry. In the Contract Documents, the neuter gender includes the feminine and masculine, and the singular number includes the plural.

While City has made an effort to identify all defined terms with initial caps, the following definitions shall apply regardless of case unless the context otherwise requires:

1. Addenda: Written or graphic instruments issued prior to the opening of Bids, which clarify, correct, or change the bidding requirements or the Contract Documents. Addenda shall not include the minutes of the Pre-Bid Conference and/or Site Visit.
2. Agreement (Document 00 5200): Agreement is the basic Contract Document that binds the parties to construction Work. Agreement defines relationships and obligations between City and Contractor and by reference incorporates Conditions of Contract, Drawings, and Specifications and contains Addenda and all Modifications subsequent to execution of Contract Documents.
3. Alternate: Work added to or deducted from the base Bid, if accepted by City.
4. Application for Payment: Written application for monthly or periodic progress or final payment made by Contractor complying with the Contract Documents.
5. Approved Equal: Approved in writing by City as being of equivalent quality, utility and appearance.
6. Architect/Engineer: If used elsewhere in the Contract Documents, “Architect/Engineer” shall mean a person (or that person’s firm) holding a valid California State Architect’s or Engineer’s license representing the City in the administration of the Contract Documents. Architect/Engineer may be an employee of or an independent consultant to City. When Architect/Engineer is referred to within the Contract Documents and not an employee of City, Architect/Engineer shall be construed to include employees of Architect/Engineer and/or employees that Architect/Engineer supervises. When the designated Architect/Engineer is an employee of City, his or her authorized representatives on the Project will be included under the term Architect/Engineer. If Architect/Engineer is an employee of City, Architect/Engineer is the beneficiary of all Contractor obligations to City, including without limitation, all releases and indemnities. Architect/Engineer may also be referred to as Architect or Engineer.
7. Asbestos: Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by OSHA or Cal/OSHA.

8. Bid: The offer or proposal of the Bidder submitted on the prescribed form(s) setting forth the prices for the Work to be performed.
9. Bidder: One who submits a Bid.
10. Bidding Documents: All documents comprising the Project Manual (including all documents and Specification Sections listed in Document 00 0110 [Table of Contents]), including documents supplied for bidding purposes only and Contract Documents.
11. Board: The governing body of the City.
12. Business Day: Any Day other than Saturday, Sunday, and the following days that have been designated as holidays by City. If a holiday falls on a Saturday, the preceding Friday will be the holiday. If a holiday falls on a Sunday, the following Monday will be the holiday.
    a. New Year's Day, January 1;
    b. Martin Luther King Jr.'s Birthday, third Monday in January;
    c. Lincoln's Birthday, February 12;
    d. Presidents' Day, third Monday in February;
    e. Malcolm X Day, third Friday in May;
    f. Memorial Day, last Monday in May;
    g. Juneteenth, June 19;
    h. Independence Day, July 4;
    i. Labor Day, first Monday in September;
    j. Indigenous People's Day, second Monday in October;
    k. Veterans' Day, November 11;
    l. Thanksgiving Day, as designated by the President;
    m. The Day following Thanksgiving Day;
    n. Christmas Day, December 25; and
    o. Each day appointed by the Governor of California and formally recognized by the Governing Board as a day of mourning, thanksgiving, or special observance.
13. By City: Work that will be performed by City or its agents at the City's expense.
14. By Others: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by City, other contractors, or other means.
15. Change Order: A written instrument prepared by City and signed by City and Contractor, stating their agreement upon all of the following:
    a. a change in the Work;
    b. the amount of the adjustment in the Contract Sum, if any; and
    c. the amount of the adjustment in the Contract Time, if any.
16. Change Proposal Request (CPR): A document prepared by Contractor requesting or initiating a request for modifying the Contract Documents and determining costs for changes in contract amount and any requested changes to Contract Time.
17. City: City is defined in Document 00 5200 (Agreement).
18. City-Furnished, Contractor Installed: Items furnished by City at its cost for installation by Contractor at its cost under Contract Documents.
19. City's Representative(s): See Document 00 5200 (Agreement).
20. Code Inspector: A local or state agency responsible for the enforcement of applicable codes and regulations.
21. Concealed: Work not exposed to view in the finished Work, including within or behind various construction elements.
22. Construction Change Directive ("CCD"): A written order prepared and signed by City, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both.

23. Contract Amount: a change order price, line item price, Contract Sum, or other price assigned to a scope of work.
24. Contract Conditions or Conditions of the Contract: Consists of two parts: General Conditions and Supplementary Conditions.
    a. General Conditions are general clauses that are common to the City Contracts, including Document 00 7200 (General Conditions).
    b. Supplementary Conditions modify or supplement General Conditions to meet specific requirements for Contract Documents, including Document 00 7201 (Supplementary Conditions).
25. Contract Documents and Contract: Contract Documents and Contract shall consist of the documents identified as the Contract Documents in Document 00 5200 (Agreement), plus all changes, Addenda, and modifications thereto.
26. Contract Modification: Either:
    a. a written amendment to Contract signed by Contractor and City; or
    b. a Change Order; or
    c. a Construction Change Directive; or
    d. a written directive for a minor change in the Work issued by City.
27. Contract Sum: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by City to Contractor for performance of the Work and the Contract Documents. The Contract Sum is also sometimes referred to as the Contract Price or the Contract Amount.
28. Contract Time: The number or numbers of calendar days or the dates stated in the Agreement to achieve Substantial Completion of the Work or designated Milestones; and/or to achieve Final Completion of the Work so that it is ready for final payment and is accepted.
29. Contractor: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neutral in gender. The term “Contractor” means the Contractor or its authorized representative.
30. Contractor’s Employees: Persons engaged in execution of Work under Contract as direct employees of Contractor, as Subcontractors, or as employees of Subcontractors.
31. Day: One calendar day of 24 hours measured from midnight to the next midnight, unless the word “day” is specifically modified to the contrary.
32. Defective: An adjective which, when modifying the word “Work,” refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of Samples and “or equal” items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by City). Unapproved substitutions are defective. City is the judge of whether Work is Defective.
33. Division of State Architect: A division of the State of California providing, design and construction oversight for K–12 schools and community colleges, and developing and maintaining accessibility standards and codes utilized in public and private buildings throughout the State of California.
34. Drawings: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
35. Equal: Equal in opinion of City. Burden of proof of equality is responsibility of Contractor.
36. Final Acceptance or Final Completion: City’s acceptance of the Work as satisfactorily completed in accordance with Contract Documents. Requirements for Final Acceptance/Final

Completion include, but are not limited to:

a. Final cleaning is completed.
b. All systems having been tested and accepted as having met requirements of Contract Documents.
c. All required instructions and training sessions having been given by Contractor.
d. All Project Record Documents having been submitted by Contractor, reviewed by City, and accepted by City.
e. All punch list Work, as directed by City, having been completed by Contractor.
f. Generally all Work, except Contractor maintenance after Final Acceptance/Final Completion, having been completed to satisfaction of City.

37. Force Account: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.

38. Exposed: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.

39. Furnish: Supply Indicated: Shown or noted on the Drawings.

40. Indicated: Shown or noted on the Drawings.

41. Install: Install or apply only, do not furnish.

42. Latent: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under Document 00 7200 (General Conditions).

43. Law: Unless otherwise limited, all applicable laws including without limitation all federal, state, and local laws, statutes, standards, rules, regulations, ordinances, and judicial and administrative decisions.

44. Material: This word shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.

45. Milestone: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.

46. Modification: Same as Contract Modification.

47. Not in Contract or "NIC": Work that is outside the scope of Work to be performed by Contractor under Contract Documents.

48. Notice of Completion: Shall have the meaning provided in California Civil Code §3093, and any successor statute.

49. Off Site: Outside geographical location of the Project.

50. Owner: Owner is the City of Berkeley, see Document 00 5200 (Agreement).

51. Partial Utilization: Use by City of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all of the Work.

52. PCBs: Polyclorinated byphenyls.

53. Phase: A specified portion of the Work (if any) specifically identified as a Phase in Document 00 5200 (Agreement) or Document 01 1100 (Summary).

54. Product Data: That information (brochures, catalog sheets, manufacturer's cut sheets, etc.) supplied by vendors having technical and commercial characteristics of the supplied equipment or materials and accompanying commercial terms such as warranties, instructions, and manuals.

55. Progress Report: A periodic report submitted by Contractor to City with progress payment

invoices accompanying progress schedule. See Document 00 7200 (General Conditions).

56. Project: Total construction of which Work performed under Contract Documents may be whole or part.

57. Project Manager: If used elsewhere in the Contract Documents, "Project Manager" shall mean a person representing the City in the administration of the Contract Documents. Project Manager may be an employee of or an independent consultant to City. When Project Manager is referred to within the Contract Documents and no Project Manager has in fact been designated, then the matter shall be referred to City. The term Project Manager shall be construed to include employees of Project Manager and/or employees that Project Manager supervises. When the designated Project Manager is an employee of City, his or her authorized representatives on the Project will be included under the term Project Manager. If Project Manager is an employee of City Project Manager is the beneficiary of all Contractor obligations to City, including without limitation, all releases and indemnities.

58. Project Manual: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, Drawings, and Specifications.

59. Project Record Documents: All Project deliverables required under the Contract Documents, including without limitation, as built drawings; Installation, Operation, and Maintenance Manuals; and Machine Inventory Sheets.

60. Provide: Furnish and install.

61. Request for Information ("RFI"): A document prepared by Contractor requesting information regarding the Project or Contract Documents. The RFI system is also a means for City to submit Contract Document clarifications or supplements to Contractor.

62. Request for Proposals ("RFP"): A document issued by City to Contractor whereby City may initiate changes in the Work or Contract Time as provided in Contract Documents.

63. Request for Substitution ("RFS"): A document prepared by Contractor requesting substitution of materials as permitted and to the extent permitted in Contract Documents.

64. RFI-Reply: A document consisting of supplementary details, instructions, or information issued by City that clarifies or supplements Contract Documents, and with which Contractor shall comply. RFI-Replies do not constitute changes in Contract Sum or Contract Time except as otherwise agreed in writing by City. RFI-Replies will be issued through the RFI administrative system.

65. Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

66. Shop Drawings: All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

67. Shown: As indicated on Drawings.

68. Site: The particular geographical location of Work performed pursuant to the Contract Documents.

69. Specifications: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards, and workmanship for the Work; performance of related services.

70. Specified: As written in Specifications.

71. Subcontractor: A person or entity that has a direct contract with 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 neutral in gender and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a

separate contractor or subcontractors of a separate contractor.

72. Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of City as evidenced by a notice or certificate of Substantial Completion, the Work is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended, and unperformed or incomplete work elements are minor in nature; or if no such certificate is issued, when the Work (or specified part) is complete and ready for final payment as evidenced by written recommendation of City for final payment. The terms “Substantially Complete” and “Substantially Completed” as applied to all or part of the Work refer to Substantial Completion thereof.
73. Supplemental Instruction: A written directive from City to Contractor ordering alterations or Modifications that do not result in change in Contract Sum or Contract Time, and do not substantially change Drawings or Specifications.
74. Testing and Special Inspection Agency: An independent entity engaged to inspect and/or test the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes.
75. Time Impact Evaluation (TIE): A written narrative and a schedule diagram depicting how the changed Work or other impact affects other scheduled activities, prepared by Contractor in conjunction with a Change Proposal Request (CPR) for Change Orders, Time Extensions, and Delays. See Document 01 3230 (Progress Schedules and Submittals), and Document 01 2600 (Modification Procedures).
76. Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities that have been installed underground to furnish any of the following services or materials: Electricity, gases, chemicals, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems, or water.
77. Unit Price Work: Shall be the portions of the Work for which a unit price is provided in Document 00 5200 (Agreement) or Section 01 1100 (Summary).
78. Work: The entire completed construction, or the various separately identifiable parts thereof, required to be furnished under the Contract Documents within the Contract Time. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents including everything shown in the Drawings and set forth in the Specifications. Wherever the word “work” is used, rather than the word “Work,” it shall be understood to have its ordinary and customary meaning.

B. Other Defined Terms

The following terms are not necessarily identified with initial caps; however they shall have the meaning set forth below:

1. Wherever words “as directed,” “as required,” “as permitted,” or words of like effect are used, it shall be understood that direction, requirements, or permission of City is intended. Words “sufficient,” “necessary,” “proper,” and the like shall mean sufficient, necessary, or proper in judgment of City. Words “approved,” “acceptable,” “satisfactory,” “favorably reviewed,” or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by City.
2. Wherever the word “may” or “ought” is used, the action to which it refers is discretionary. Wherever the word “shall” or “will” is used, the action to which it refers is mandatory.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 4500

TESTING AND INSPECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Regulatory requirements for testing and inspection.
2. Contractor's quality control.
3. Quality of the Work.
4. Inspections and tests by governing authorities.
5. Inspections and tests by serving utilities.
6. Inspections and tests by manufacturer's representatives.
7. Inspections by Independent Testing and Inspection Agency.

1.02 RELATED SECTIONS

A. Document 00 7200 General Conditions

B. Section 01 4100 Regulatory Requirements

1.03 CONTRACTOR'S QUALITY CONTROL

A. Contractor's Quality Control: Contractor shall ensure that products, services, workmanship and site conditions comply with requirements of the Drawings and Specifications by coordinating, supervising, testing and inspecting the work and by utilizing only suitably qualified personnel.

B. Quality Requirements: Work shall be accomplished in accordance with quality requirements of the Drawings and Specifications, including, by reference, all Codes, laws, rules, regulations and standards. When no quality basis is prescribed, the quality shall be in accordance with the best accepted practices of the construction industry for the locale of the Project, for projects of this type.

C. Quality Control Personnel: Contractor shall employ and assign knowledgeable and skilled personnel as necessary to perform quality control functions to ensure that the Work is provided as required.

1.04 QUALITY OF THE WORK

A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects and fit for the intended use.

B. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements.

C. Protection of Completed Work: Take all measures necessary to preserve completed Work free from damage, deterioration, soiling and staining, until Acceptance by the City.

D. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report

requirements in preparing, fabricating erecting, installing, applying, connecting and finishing Work.

E. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.

F. Verification of Quality: Work shall be subject to verification of quality by City or Architect/Engineer in accordance with provisions of the General Conditions of the Contract.

1. Contractor shall cooperate by making Work available for inspection by City, Architect/Engineer or their designated representatives.
2. Such verification may include mill, plant, shop, or field inspection as required.
3. Provide access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
4. Provide all information and assistance as required, including that by and from subcontractors, fabricators, materials suppliers and manufacturers, for verification of quality by City or Architect/Engineer.
5. Contract modifications, if any, resulting from such verification activities shall be governed by applicable provisions in the General Conditions of the Contract.

G. Observations by Architect/Engineer: Periodic and occasional observations of Work in progress will be made by Architect/Engineer as deemed necessary to review progress of Work and general conformance with design intent.

H. Limitations on Inspection, Test and Observation: Neither employment of independent testing and inspection agency nor observations by Architect/Engineer shall in way relieve Contractor of obligation to perform Work in full conformance to all requirements of Contract Documents.

I. Rejection of Work: City reserves the right to reject all Work not in conformance to the requirements of the Drawings and Specifications.

J. Correction of Non-Conforming Work: Non-conforming Work shall be modified, replaced, repaired or redone by the Contractor at no change in Contract Sum or Contract Time.

K. Acceptance of Non-Conforming Work: Acceptance of nonconforming Work, without specific written acknowledgement and approval of the City, shall not relieve the Contractor of the obligation to correct such Work.

L. Contract Adjustment for Non-Conforming Work: Should City determine that it is not feasible or in City's interest to require non-conforming Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between City and Contractor. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with applicable provisions of the General Conditions.

1.05 INSPECTIONS AND TESTS BY GOVERNING AUTHORITIES

A. Regulatory Requirements for testing and Inspection: Comply with Uniform Building Code (UBC) requirements and all other requirements of governing authorities having jurisdiction.

B. Inspections and Tests by Governing Authorities: Contractor shall cause all tests and inspections required by governing authorities having jurisdiction to be made for Work under this Contract.

1. Such authorities include the Division of Occupational Safety and Health (Cal/OSHA), City of Berkeley Public Works Department, Fire Department, and similar agencies.
2. Except as specifically noted, scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.

1.06 INSPECTIONS AND TESTS BY SERVING UTILITIES

A. Inspections and Tests by Serving Utilities: Contractor shall cause all tests and inspections required by serving utilities to be made for Work under this Contract. Scheduling conducting and paying for such inspections shall be solely the Contractor's responsibility.

1.07 INSPECTIONS AND TESTS BY MANUFACTURER'S REPRESENTATIVES

A. Inspections and Tests by Manufacturer's Representatives: Contractor shall cause all tests and inspections specified to be conducted by materials or systems manufacturers to be made. Additionally, all tests and inspections required by materials or systems manufacturers as conditions of warranty or certification of Work shall be made, the cost of which shall be included in the Contract Sum.

1.08 INSPECTIONS BY INDEPENDENT TESTING AND INSPECTION AGENCY

A. City will select an independent testing and inspection agency or agencies to conduct tests and inspections as indicated on Drawings, in Specifications and as required by governing authorities having jurisdiction.

B. Responsibility for payment for tests and inspections shall be as indicated in schedule below. All time and costs for Contractor's service related to such tests and inspections shall be included in Contract Time and Contract Sum.

C. Contractor shall notify City and, if directed by City, testing and inspection agency, when Work is ready for specified tests and inspections.

D. Contractor shall pay for all additional charges by testing and inspection agencies and governing authorities having jurisdiction due to the following:

1. Contractor's failure to properly schedule or notify testing and inspection agency or authorities having jurisdiction.
2. Changes in sources, lots or suppliers of products after original tests or inspections.
3. Changes in means methods, techniques, sequences and procedures of construction which necessitate additional testing, inspection and related services.
4. Changes in mix designs for concrete and mortar after review and acceptance of submitted mix design.

E. Tests and inspections shall include the following:

Section	Inspections and Tests	Paid by
Section 312200- Earthwork	Materials and compaction	Paid by City.
Section 321000- Aggregate Base	Materials and compaction	Paid by City.
Section 321216- Asphalt Concrete	Compaction	Paid by Contractor.
Section 321312- Concrete Reinforcing & Miscellaneous Steel	Reinforcement strength	Paid by City.
Section 321313- Cast-in-Place Concrete	Slump Tests Compressive strength	Paid by City. Paid by City.

F. Test and Inspection Reports: After each inspection and test, one copy of report shall be promptly submitted each to Architect/Engineer, City, City's field representative, Contractor and to agency having jurisdiction (if required by Code).

1. Reports shall clearly identify the following:

   a. Date issued.
   b. Project name and number.
   c. Identification of product and Specifications Section in which Work is specified.
   d. Name of inspector.
   e. Date and time of sampling or inspection.
   f. Location in Project where sampling or inspection was conducted.
   g. Type of inspection or test.
   h. Date of test.
   i. Results of tests.
   j. Comments concerning conformance with Contract Documents and other requirements.

2. Test reports shall indicate specified or required values and shall include statement whether test results indicate satisfactory performance of products.

3. Samples taken but not tested shall be reported.

4. Test reports shall confirm that methods used for sampling and testing conform to specified test procedures.

5. When requested, testing and inspection agency shall provide interpretations of test results.

6. Verification reports shall be prepared and submitted, stating that tests and inspections specified or otherwise required for the project, have been completed and that material and workmanship comply with the Contract Drawings and Specifications. Verification reports shall be submitted at intervals not exceeding 6 months, at Substantial Completion of the Project, and at all times when Work of Project is suspended.

G. Contractor Responsibilities in Inspections and Tests:

1. Notify testing and inspection agencies 24 hours in advance of expected time for operations requiring inspection and testing services.

2. Deliver to laboratory or designated location, adequate samples of materials proposed to be used which require advance testing, together with proposed mix designs.

3. Cooperate with testing and inspection agency personnel, City's field representative, Architect/Engineer. Provide access to Work areas and off-site fabrication and assembly locations, including during weekends and after normal work hours.

4. Provide incidental labor and facilities to provide safe access to Work to be tested and inspected, to obtain and handle samples at the Project site or at source of products to be tested, and to store and cure test samples.

5. Provide, at least 15 calendar days in advance of first test or inspection of each type, a schedule of tests or inspections indicating types of tests or inspections and their scheduled dates.

6. Provide 24 hours advance notice to the Project Manager, Architect/Engineer of each test and inspection, as directed.

   a. When tests or inspections cannot be performed after such notice , reimburse City for Testing Laboratory personnel and travel expenses incurred due to Contractor's negligence.

1.09 ADDITIONAL TESTING AND INSPECTION

A. If initial tests or inspections made by the Testing Laboratory reveal that materials do not comply with Contract Documents, or if City has reasonable doubt that materials do not comply with Contract Documents, additional tests and inspections shall be made as directed.

1. If additional tests and inspections establish that materials comply with Contract Documents, all costs for such tests and inspections shall be paid by City.
2. If additional tests and inspections establish that materials do not comply with Contract Documents, all costs of such tests and inspections shall be deducted for Contract Sum.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

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Form Page: West Berkeley Service Center Improvement Project
Trial: Specification No.21-11604-C

Form Page:

Title of Project	West Berkeley Service Center Improvement Project
Additional Description if Required	
Address of Project	1900 Sixth Street, Berkeley, CA 94710
Project Manager's Name	Titus Chen
Specification No.	21-11604-C

Test Project Name Here: West Berkeley Service Center Improvement Project

Test Additional Description Here:

Test Address of Project Here: 1900 Sixth Street, Berkeley, CA 94710

Test Project Manager's Name Here: Titus Chen

Test Specification Number Here: 21-11604-C

NOTE: Print Preview to automatically update all fields.

Contents of General Requirements:

01 5200	Temporary Facilities
01 5526	Traffic Control
01 5600	Noise Control
01 5700	Temporary Controls
01 7329	Cut- Patch
01 7419	Project Cleaning
01 7700	Contract Closeout
01 7800	Closeout Submittals

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 5200

TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. General Conditions Document 00 7200

B. Supplemental General Conditions Document 00 7201

1.02 SUMMARY

A. This section describes the temporary facilities required for the Project site. The Project site shall be maintained by Contractor as set forth in this section unless otherwise added to or superseded by the requirements of Document 00 7200 (General Conditions).

1.03 TEMPORARY FACILITIES

A. Contractor shall obtain permits for, install and maintain in safe condition, whatever scaffolds, hoisting equipment, barricades, walkways, or other temporary structures which may be required to accomplish the work on the Project. Such structures shall be adequate for the intended use and capable of safely accepting all loads that may be imposed upon them. They shall be installed and maintained in accordance with all applicable State and local codes and regulations.

B. Contractor shall provide and maintain temporary heat from an approved source whenever in the course of the Work it may become necessary for curing and drying of materials, or to warm spaces as may be required for the installation of materials or finishes.

C. Contractor shall provide and maintain any and all facilities that may be required for dewatering in order that work may proceed on the Project. If it is necessary for dewatering to occur continually, Contractor shall have on hand whatever spare parts or equipment that may be required to prevent interruption of dewatering.

D. Contractor shall provide and maintain all utility services necessary to perform the work under this Contract.

E. Materials, tools, accessories, etc., shall be stored only where directed by City. Storage area shall be kept neat and clean. Security of stored items shall be Contractor's responsibility.

F. Flammable materials stored on site, shall be stored in a safe and secure manner per the manufacture’s direction. Extra precautions, including clear identification, shall be the responsibility of Contractor.

G. Contractor shall maintain an office at the Project site that will be his headquarters for the Project. Any communications delivered to this office shall be considered as delivered to Contractor. Location and size of office shall be such that it will adequately serve the needs of Contractor's superintendent and assistants in the performance of their duties.

H. Contractor shall promptly remove all such temporary facilities when they are no longer needed for the work or for completion of the Project, mutually agreed upon by Contractor and City.

1.04 SIGNS

A. No signs may be displayed on or about the City's property (except those required by law) without the City's specific approval; the size, content, and location to be as specified by the

City.

1.05 USE OF ROADWAYS AND WALKWAYS

A. Contractor shall never block or interfere with use of any existing roadway, walkway or other facility for vehicular or pedestrian traffic, from any party entitled to use it. Wherever and whenever such interference becomes necessary for the proper and convenient performance of the Work, and no satisfactory detour route exists, Contractor shall, before beginning the interference, notify City and post signs at least 72 hours in advance of such interference, and provide a satisfactory detour, including temporary bridge if necessary, or other proper facility for traffic to pass around or over the interference. Contractor shall maintain the detour in a safe and satisfactory condition as long as the interference continues, all without extra payment unless otherwise expressly stipulated in the Specifications.

B. Contractor shall at all times comply with any and all requirements applying to the work under the transportation, circulation and parking mitigation measures, truck and construction access plan.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 5526

TRAFFIC CONTROL

Contractor shall provide traffic control throughout the project as needed for the various traffic situations and street configurations in full conformance with the latest "California Manual on Uniform Traffic Control Devices and the Federal Highway Administration (FHWA) Manual of Uniform Traffic Control Devices (MUTCD) latest edition, as amended for use in California)" herein after referred to as Traffic Control Manual. The Traffic Control Manual may be obtained online at https://dot.ca.gov/programs/safety-programs/camutcd/camutcd-files

As required, the Contractor shall submit a Traffic Control Plan to the City of Berkeley's Transportation Division or the California Department of Transportation (Caltrans).

Construction area signs and temporary traffic control devices shall be furnished, installed, maintained and removed by the Contractor. Traffic signage, e.g., warning signs and detour signs, may be required for this project. Contractor shall be responsible for placing all barricades for perimeter street closures as required. Per Section 501.10 – Traffic Control of the General Provisions, at main entry and exit points of each work location, the Contractor shall provide a 30" x 30" sign advising the public of the anticipated period of time that traffic delays may be anticipated. This sign will also include name and telephone number of the Contractor along with starting and completion dates of the contract. Sign will be erected 7 calendar days in advance of any work.

Construction work requiring traffic control on San Pablo Avenue (State Route 123) or Ashby Avenue (State Route 13) will require an encroachment permit from Caltrans. Contractor is soley responsible for obtaining and abiding by any necessary encroachment permits. The permit fees and other associated costs to obtain the required permits from the State of California shall be included in the cost bid for this item. Contractor shall be responsible for providing traffic control plan for encroachment permit to and obtaining approval of said traffic control plan from State of California. Contractor shall be responsible for all notification of work to, application for and obtaining work authorization number from Caltrans. Any damages arising from work related to encroachment permit shall be the responsibility of the Contractor.

The Contractor shall be responsible for posting "No Parking" signs a minimum of four calendar days in advance of concrete work, paving operations, failed area, and planning work so as to comply with the City's construction notification requirement of 4 days. Cones shall not be used as barricades. "No Parking" signs may be obtained from the City at no cost to the Contractor. The "No Parking" signs shall be updated as necessary. The Contractor shall check and maintain (e.g., re-install missing signs, reposition displaced barricades, etc.) postings on a regular basis prior to start of work.

If traffic is to be detoured over a centerline or detoured in advance of the work, detour plans must be part of the submitted Traffic Control plans and approved by the City prior to starting work. Police, Fire and Public Works Department shall be notified by the contractor at least four calendar days in advance of any work which will interfere with the normal flow of vehicular or pedestrian traffic. Intersection closure may only occur if the two adjacent intersections remain open, unless otherwise approved by the City. The Contractor shall coordinate his traffic control/diversion plan with the City, a minimum of 3 weeks prior to starting work, to assure that traffic is diverted in a safe and convenient manner.

Truck routes shall be approved by the City prior to start of work.

Truck traffic is not allowed on Marin Avenue within the City of Albany. Personal vehicles of the Contractor's employees shall not be parked within the area of work.

A minimum of one (paved) traffic lane, not less than 12 ft. wide, shall remain open for use by public traffic during construction operations. When construction operations are not actively in progress, not less than two such lanes shall be open to public traffic. The Contractor may be allowed to close residential streets if approved in writing in advance by the City. No work that interferes with public traffic shall be performed between 6:00 p.m. and 7:00 a.m.

Start of work shall be no earlier than 7:00 a.m. No work process, including starting, warm up, and delivery of equipment, shall be done outside of work hours. The use of vehicle horns to alert residents to move their vehicles out of the construction zone is not permitted. The Contractor should attempt to locate vehicle owners by knocking on doors.

The full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays and designated legal holidays, and when construction operations are not actively in progress, unless specified otherwise.

Minor deviations from the requirements of this section concerning hours of work may be permitted upon the written request of the Contractor, if in the opinion of the City, public traffic will be better served and the work expedited. Such deviations shall not be adopted until the City provides written approval.

The traffic control system shall consist of closing traffic lanes in accordance with the Traffic Control Manual. Signs and other devices for the traffic control system shall conform to the Traffic Control Manual.

If any component in the traffic control system is damaged, displaced or ceases to operate or function as specified, from any cause during the progress of the work, the Contractor shall immediately repair said component to its original condition or replace said component and shall restore the component to its original location.

Lane closures may be made for work periods only. At the end of each work period, all components of the traffic control system shall be removed from the traveled way, shoulder and auxiliary lanes. If the Contractor so elects, said components may be stored at selected central locations approved by the City within the limits of the public right-of-way.

Sufficient barricades and flashing lights shall also placed to supplement all traffic signs used to divert and control traffic. Signs and barricades shall be checked periodically every day and replaced or repaired as necessary. Any hazardous conditions shall be immediately eliminated.

The Contractor, at the end of each day, shall provide ADA compliant pedestrian and vehicle crossings at all street intersections. If the project is left open overnight, it shall be graded in such a way that pedestrians and vehicles can safely pass through the project. Temporary concrete, asphalt, or wood ramps shall be installed and maintained at all locations where existing ramps have been temporarily removed.

Cleanliness is extremely important. Dust producing conditions shall be eliminated as soon as they are created.

If Contractor violates any of these provisions, a fine of $1,000 will be assessed for the first violation, $5,000 for the second and $10,000 for the third and further subsequent violations**.**

ACCESS AND EGRESS

The Contractor shall endeavor to cooperate with all business owners and residents occupying properties fronting on the streets in the matter of access and egress. **Contractor shall maintain a clear and accessible pedestrian corridor.**

Where a business property has more than two vehicular paths of access, one path, 10 feet in width, shall remain open during all business hours, unless accepted by the City.

LANE CLOSURES

No lane closures shall be permitted on the following streets Monday through Friday between 7:00 A.M. – 9:00 A.M. and 4:00 P.M. – 6:00 P.M., and Saturdays between 10:00 A.M. – 2:00 P.M., unless approved in advance by the City, if it can be explained why such closure cannot reasonably be avoided. On Saturdays when UC football games are scheduled all construction-related lane closures along these corridors must be reopened at least 4 hours before the start of the game and remain open for 2 hours after the conclusion of the game.

Major Streets:

- University Avenue
- San Pablo Avenue
- Shattuck Avenue
- Telegraph Avenue
- Sacramento Street
- Martin Luther King Jr. Way
- Ashby Avenue
- College Avenue
- Gilman Avenue
- Adeline Street

Notwithstanding the above, the City reserves the right to review and comment on each individual traffic control plan based on its own merits.

Note: Routine maintenance, inconvenience to construction method or schedule, or adverse impacts on cost of work will generally not be accepted as grounds for exceptions.

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 5700

TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. General Conditions Document 00 7200

B. Supplemental General Conditions Document 00 7201

1.02 SUMMARY

A. This section describes the temporary controls required for the Project site. The Project site shall be maintained by Contractor as set forth in this section unless otherwise added to or superseded by the requirements of Document 00 7200 (General Conditions).

1.03 TEMPORARY CONTROLS

A. Contractor shall obtain permits for, install and maintain in safe condition, whatever scaffolds, equipment, shoring, barricades, walkways, or other temporary structures which may be required to accomplish the Work. Such items shall be adequate for the intended use and shall be installed and maintained in accordance with all applicable State and local codes and regulations.

B. The Contractor shall perform a pre-construction audio/video tape survey and provide supplemental photographic documentation to adequately document the condition of existing improvements. It is the responsibility of the Contractor to adequately document the condition of existing improvements and the Contractor may be held liable for any damage or condition whose pre-existence he/she is unable to document. No additional compensation for such tape survey and still photographs will be allowed.

C. Upon notification of the City, the Contractor shall correct any deficiencies of the temporary controls within 72 hours. The City may request City crews or contract with another contractor to perform the necessary work and repairs if the deficiencies have not been corrected after the 72-hour notification. The Contractor shall pay the cost of the work performed by the City crews or other contractor plus an additional seventy percent (70%) surcharge by deduction from payment due on the contract.

D. The Contractor shall begin cleanup operation at least one hour before the end of each day's work, clean all paved portions of the project and paved streets leading from the project that have dust-producing materials or debris deposited upon them. The work areas shall be swept clean at the end of each day's work and at other times when directed by the City.

1.04 DUST AND DEBRIS CONTROLS

A. The Contractor shall be responsible for controlling dust in the air and rocks, debris, mud or dirt which are scattered as a result of his operations on the job. The Contractor shall be responsible for cleaning all mud, rock, dust, dirt, and debris-producing materials that originate in the project area and are deposited on other public or private property by truck tires, spillages, or by other means. The Contractor shall have suitable and adequate street cleaning equipment on the project site at all times.

B. The Contractor shall endeavor, whenever possible, to restrict the use of water to control dust for his convenience in order to conserve water during drought situations or

mandated rationing required by the Water Utility Company. Whenever flushing of streets or any other work is necessary, the Contractor shall provide filter materials at the catch basin to retain any debris and dirt flowing into the City's drainage system.

C. The cost of the above work, including the providing of barricades, water and other materials, labor, and equipment shall be at the sole cost and expense of the Contractor.

D. The City may determine that an emergency exists when dust, rocks, debris, mud, or dirt are scattered in the public right of way or in the private properties as a result of Contractor's activities and/or deterioration of such conditions due to rain. The emergency conditions may also be declared when traffic or the Contractor's equipment travelling through a job causes dust to fly or rocks, debris, mud, or dirt to be scattered. Similar emergency conditions may be determined by the City's Representative if the storage of materials, tools, or any other equipment related to the project, in the public rights of way, is causing any obstruction or blocks access to the neighboring properties and/or dangerously placed without proper barricades and lights and/or backfill stockpiles or debris washing away into the street gutter and catch basins.

1.05 NOISE CONTROL

A. Equipment which operates with noise levels in excess of 85 decibels measured on the A-weighted scale defined in ANSI S-1.4 at a distance of 100 feet from the equipment is prohibited.

B. All equipment and impact tools shall have mufflers to comply with specified noise control.

C. Use of unusually noisy equipment, such as jackhammers and roto-hammers is prohibited.

D. Exterior construction work is limited to the hours of 8 AM to 5 PM.

E. Cooperate with City if an ongoing construction activity becomes objectionable by its longevity, or by overlapping into an activity started later by the City. It is understood and agreed that both parties shall cooperate so that neither will be unduly inconvenienced by this requirement.

F. Comply by requirements specified in the various sections.

1.06 CLEAN UP

A. The Contractor shall not allow the site of the work to become littered with trash, rubbish, and waste material but shall maintain the same in a neat and orderly condition throughout the construction period. Cleanup, debris and dust control shall be a daily maintenance requirement. The City shall have the right to determine what is or is not trash, rubbish or waste material and the place and manner of disposal.

B. The Contractor shall maintain a neat appearance to the work. Contractor shall promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids and cleaning solutions from surfaces to prevent marring or other damage.

C. Broken concrete debris, and unsuitable excavated native soil during construction shall be disposed of concurrently with its removal. If stockpiling is necessary all debris shall be placed in trash bins daily and shall be removed or disposed of weekly. Any waste shall not be buried on the site or disposed of into storm drains, sanitary sewers, streams, or waterways.

D. Forms or falsework that are to be re-used shall be stacked neatly concurrently with their removal. Forms and falsework that are not to be re-used shall be disposed of concurrently with their removal.

E. Full compensation for conforming to the provisions in this section, not otherwise provided for, shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed therefore.

F. Sidewalks, street area, parking strips, and driveway approaches must be kept reasonably

clean at all times during construction and be completely and carefully cleaned after the work has progressed beyond the immediate vicinity to the satisfaction of the City's Representative. Reasonable cleanup is defined as no dust, rock, or mud on any portion of the public right-of-way or the private properties as a result of the Contractor's work.

1.07 EMERGENCY CLEAN UP WORK

A. In any case in which the Contractor fails to satisfactorily complete the cleanup work described in this section, the City may determine that an emergency exists. In the event an emergency is determined by the City, the Contractor will be notified by the City to correct the violation immediately. The Contractor shall immediately make available manual labor or mechanical equipment capable of handling the cleaning process. During such an emergency, City forces may be called upon to complete the cleanup work, or the City may contract for the cleanup work. All construction work shall be shut down during this cleanup work by the City/contract forces. The City may shut down further construction work until the violations are corrected to the satisfaction of the City. The cost of the work performed by City/Contract forces plus an additional 70% surcharge shall be paid by the Contractor by deduction from payment due him on the contract. No compensation shall be given to the Contractor for stoppage of work.

B. Such action by the City, however, shall not relieve the Contractor of his responsibility for any damages which may occur before, during or after such action has been taken by the City, and shall place no liability upon the City.

1.08 FINAL CLEAN UP

A. Upon completion of the work, and before acceptance and final payment, the Contractor shall clean the project areas and remove all surplus and discarded materials, falsework, rubbish and temporary structures and restore in an acceptable manner all property, both public and private, which has been damaged during the prosecution of the work, and shall leave the improvement in a neat and presentable condition throughout the entire length of the improvement under contract to the satisfaction of the City. If the Conditions as noted above are not corrected immediately, the City may declare an emergency and take necessary action in accordance with the Emergency Cleanup Work section of this specification.

1.09 CLEAN UP AND SAFETY

A. If the Contractor stockpiles granular material in the gutter, he must provide a minimum 4" pipe below the stockpile in the gutter to accommodate typical gutter flow. Any lumber or stockpiles on the site, not ready for immediate use, shall be free of nails or torn edges that may cause injury. Any materials stockpiled in the street and any open excavation shall have barricades equipped with operative automatic flashers placed at each end. The Contractor shall maintain a neat appearance at all times. All material removed shall be disposed of off-site in a legal manner.

B. The Contractor must take special precautions to protect the public and City employees from bodily and property damage resulting from the work. Contractor must exercise all necessary precautions to ensure a safe execution of the work.

1.10 CREEK PROTECTION [OPTIONAL]

A. The Contractor shall be responsible for and conduct all aspects of the work within the requirements of BMC Chapter 17.08 – PRESERVATION AND RESTORATION OF NATURAL WATERCOURSES (Creek Ordinance), and any other creek protection requirements by other agencies.

B. Portions of Work involving a creek channel may not be permitted between October 15 through April 15 or other dates as may be stipulated in applicable permits.

C. Any work between creek banks shall be conducted to not create conditions, which will allow erosion, and shall be fully restored to at least the same erosion resistant condition as before the Work.

D. Complying with the requirements of creek protection shall include but not be limited to scheduling the Work around any time periods prohibiting work within creek limits, installing erosion control measures and employing appropriate BMPs for controlling erosion, monitoring, updating and modifying BMPs to meet the requirements for changing site conditions to comply with erosion control and creek protection, replanting creek banks to reestablish erosion resistance and bank stability.

1.11 PROJECT SITE MAINTENANCE

A. Water Pollution Control. The intent of these requirements is to enforce federal, state, and other local agencies' regulations that prohibit storm water pollution at construction sites. Storm drains discharge directly to creeks and the Bay without treatment, and discharge of pollutants (i.e., any substance, material, or waste other than uncontaminated storm water) into the storm drain system is strictly prohibited.

B. The term "storm drain system" shall include storm water conduits, storm drain inlets and other storm drain structures, street gutters, channels, watercourses, creeks, lakes, and the San Francisco Bay.

C. For the purpose of eliminating storm water pollution, the Contractor shall implement effective control measures at construction sites. There are several publications that provide guidance on selecting and implementing effective control measures known as Best Management Practices (BMPs). BMPs include schedules of activities, prohibition of specific practices, general good housekeeping practices, operational practices, pollution prevention practices, maintenance procedures and other management procedures to prevent the discharge of pollutants directly or indirectly to the storm drain system. BMPs also include the construction of some facilities that may be required to prevent, control, and abate storm water pollution. The reference publications are as follows:

1. California Storm Water Best Management Practice Handbook - Industrial/Commercial
2. California Storm Water Best Management Practice Handbook - Construction Activity

These handbooks may be purchased from Blue Print Service (BPS), 1700 Jefferson St, Oakland, CA 94612.

3. Manual of Standards for Erosion and Sediment Control Measures by the Association of Bay Area Governments (ABAG).
4. Heavy Equipment Operation, Fresh Concrete & Mortar Application, Painting & Application of Solvents & Adhesives, Roadwork & Paving Activities, General Construction & Site Supervision, Parking Lots and Finish the Pour Right

These brochures are available at the Engineering Division, 1947 Center Street, 4th Floor, Berkeley, CA 94704.

1.12 STORMWATER POLLUTION CONTROL

A. Stormwater Pollution Control. The intent of these requirements is to comply with federal, state, and other local agencies' regulations that prohibit non-stormwater discharges to storm drain sewer systems, creeks and San Francisco Bay. Storm drain sewers discharge directly to creeks and the Bay without treatment, and discharge of pollutants (any substance, material, or waste other than rainfall derived stormwater) into the storm drain sewer system is strictly prohibited. Further, the Contractor is informed that Federally Endangered species have been identified in creeks within the City Limits. The storm drain sewer system, pollutants, and other relevant information are further defined in

Berkeley Municipal Code (BMC) Chapter 17.20 DISCHARGE OF NON-STORMWATER INTO CITY'S STORM DRAIN SYSTEM – REDUCTION OF STORMWATER POLLUTION, and the City's stormwater NPDES (National Pollutant Discharge Elimination System) Permit No. CAS612008. These documents are available upon request.

B. Best Management Practices (BMP) and Source Control. The contractor shall use appropriate BMPs and source control techniques on the site(s) at all times, regardless of time of year or rainfall conditions, in order to prohibit the discharge of non-stormwater discharges into the storm drain sewer system, creeks, and Bay. BMPs shall be in conformance with the California Stormwater Quality Association's "Stormwater Best Management Practice Handbook", current edition.

C. Water Pollution Control Plan (WPCP) and Coordinator. The Contractor shall prepare, submit for favorable review by the City, and implement a WPCP which shall contain at a minimum the items included in this section.

1. The Contractor shall designate an individual (to be approved by the City) available at all times of sufficient authority to halt work and implement BMPs and source control measures for the Contractor and all sub-contractors, suppliers, and other personnel that may be at the construction site(s), to prevent non-stormwater discharges from the construction site(s). This individual shall be the contact person for all matters of the project regarding non-stormwater discharges.
2. The WPCP shall show the locations of all storm drains, storm drain pipes, creeks, creek culverts, points of entry (catch basins, inlets, outlets), and other features through which stormwater flows.
3. The WPCP shall identify each point of entry and show how each entry point will be protected. The WPCP shall include a protocol for allowing drainage to flow properly during rainfall events WHILE STILL PREVENTING non-stormwater discharges from entering the storm drains, creeks, and Bay.
4. The WPCP shall include descriptions and sketches of all BMPs, show locations and describe protocols for implementing and maintaining the following BMPs for but not limited to material storage, dewatering operations, bypass pumping, saw-cutting operations, pavement operations, concrete operations, grading and excavation operations, spill prevention and control, vehicle and equipment cleaning, vehicle and equipment operation and maintenance, litter control, dust control, pavement cleaning, and construction waste management.
5. All employees, subcontractors, suppliers, and any others involved with the construction site(s) shall be trained in implementing, the importance of, and purpose of the WPCP.
6. The WPCP shall be updated to meet changing stages of the construction site(s). Work shall not begin without the City completing its review and finding no exceptions taken on the WPCP and finding at City's sole discretion that the WPCP meets the intent and goals of the project.
7. In addition, the Contractor shall observe the following guidelines:
   a. Paving during wet weather:
      i. No paving while it is raining.
      ii. No paving of the top lift of asphalt concrete (AC) on any day that experiences ¼" of rain in a twenty-four period.
      iii. No paving of bottom lift if previous seventy-two (72) hour period experienced more than ½" of rain, unless directed by the City Engineer or his designee.
   b. Store materials as required by BMPs.

c. Cover inlets and manholes when applying asphalt, seal coat, tack coat, slurry seal, fog seal, etc., and while sawcutting, grooving, and grinding, etc.
d. Place drip pans or absorbent materials under equipment when not in use.
e. During wet weather, store paving equipment indoors or cover with tarp or other waterproof covering.
f. Sweep site daily to prevent sand, gravel or excess asphalt from entering or being transported by rain into the storm drain system.
g. Keep ample supplies of drip pans or absorbent materials on-site.
h. If paving involves Portland cement concrete:
    i. Do not wash out concrete trucks into storm drains, open ditches, streets, streams, etc. The Contractor shall prevent the discharge of pollutants from concrete operations by using measures to prevent run-on and run-off pollution, properly disposing of wastes, and by implementing the following BMP's:
        a. Store all materials in waterproof containers or under cover away from drain inlets or drainage areas.
        b. Avoid mixing excess amounts of Portland cement materials. Dispose of any excess materials properly.
        c. Whenever possible, perform washout of concrete trucks off-site where discharge is controlled and not permitted to discharge to the storm drain system.
    ii. For on-site washout:
        a. Locate washout area at least fifty (50) feet from storm drains, open ditches or other water bodies, preferably in a dirt area.
        b. Confine run-off from this area by constructing a temporary pit or bermed area large enough for the liquid and solid waste.
    iii. Wash out concrete wastes into the temporary pit where the concrete can set, be broken up and then disposed of properly. If the volume of water is greater than what will allow concrete to set, allow the wash water to infiltrate and/or evaporate, if possible. Remove or vacuum the remaining silt and debris from the ponding or bermed area and dispose of it properly.
    iv. Dispose of waste water from washing of exposed aggregate to dirt area. The dirt area shall be adequate to contain all the waste water and once the waste water has infiltrated, any remaining residue must be removed.
    v. Collect and return sweepings from exposed aggregate concrete to a stockpile or dispose of the waste in trash container.

D. Training. Contractor is responsible for ensuring all personnel, laborers, sub-contractors, suppliers, and any other personnel that are involved with the Work are trained in the importance of preventing non-stormwater discharges. Each worker shall be trained or certified as being trained before being allowed to work. Before any work begins, the Contractor shall submit and certify under penalty of perjury a list of all workers who have been trained on the importance of pollution prevention, BMP and source control operation and maintenance, and recognize the authority of the City to stop the work in the event of a non-stormwater discharge. The training shall include as a minimum, review of the BMP and WPCP, and all BMPs (including BMP operation and maintenance) that are planned for the Work.

E. Enforcement. The City has the authority through this contract and appropriate sections of the BMC to enforce any portions of this section. City enforcement may include but is not limited to: citations, orders to abate, bills for City cleanup costs and administration, civil suits, and criminal charges and enforcement. Enforcement action by the City does not void or suspend any enforcement actions by other agencies, and actions by the City and other agencies shall be cumulative.

F. Submittals and Contract Time. Contractor is cautioned and advised to have appropriately trained staff with any applicable certifications prepare all submittals for Storm Water

Pollution Controls including the WPCP, and have appropriately trained staff available to meet with City staff to review the submittals. It is considered reasonable that the Contractor shall make a complete and acceptable submittal at least by the second submission. The City reserves the right to deduct monies from payments due Contractor to cover additional costs of City's and Architect/Engineer's review beyond the second submission. Illegible submittals will be rejected and returned to the Contractor.

G. Payment. There shall be no separate pay item for complying with the provisions of this section, unless a separate pay item is provided in the bid schedule.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7329

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SUMMARY

A. Contractor shall be responsible for all cutting, fitting, and patching required to complete the work and to:

1. Make its several parts fit together properly,
2. Uncover portions of the work to provide for installation of ill-timed work,
3. Remove and replace defective work,
4. Remove and replace work not conforming to requirements of Contract Documents,
5. Provide routine penetrations of nonstructural surfaces for installation of electrical conduit, plumbing, and ductwork,
6. Remove Samples of installed work as specified for testing.

1.02 SUBMITTALS

A. Submit a written request to the Architect/Engineer two weeks in advance of executing any cutting or alteration that affects the following and is not specifically indicated on the Drawings as part of the Scope of Work:

1. Work of the City or any separate contractor,
2. The structural value or integrity of any element of the completed building,
3. The integrity or effectiveness of weather-exposed or moisture-resistant elements or systems,
4. The efficiency, operational life, maintenance, and safety of operational elements,
5. The visual qualities of sight-exposed elements.

B. The request shall include:

1. The necessity for cutting or alteration,
2. The effect on the work of the City or any separate contractor or on the structural or weatherproof integrity of the building,
3. Description of the Proposed Work:
    a. The scope of cutting, patching, alteration, or excavation,
    b. The trades who will execute the work,
    c. The products proposed to be used,
    d. The extent of refinishing to be done.
4. Alternatives to cutting and patching,
5. Cost proposal, when applicable,
6. Written permission of any separate contractor whose work will be affected.

C. Should conditions of the work or the schedule indicate a change of products from the original installation, submit a request for substitution per Section 00 6325 Substitution Request Form.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Comply with specifications and standards for each specific product involved.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine existing conditions of the Project, including elements subject to damage or to movement during cutting and patching.

B. After uncovering work, examine the conditions affecting the installation of products or performance of the Work.

C. Report unsatisfactory or questionable conditions to the Project Manager in writing. Do not proceed with the work until the Project Manager has provided further instructions.

3.02 PREPARATION

A. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the work.

B. Provide devices and methods to protect other portions of the Project from damage.

C. Provide protection from the elements for that portion of the Project that may be exposed by cutting and patching work.

3.03 PERFORMANCE

A. Execute cutting and demolition by methods that will prevent damage to other work and will provide proper surfaces to receive installation of repairs.

B. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.

C. All plumbing, mechanical, and electrical system elements shall be concealed, unless indicated otherwise.

D. Restore work which has been cut or removed; install new products to provide completed work in accordance with requirements of Contract Documents.

E. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

F. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes.

1. For continuous surfaces, refinish to nearest intersection.

2. For an assembly, refinish the entire unit.

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7413

PROJECT CLEANING

PART 1 - GENERAL

1.01 SUMMARY

A. Maintain Project Site, surrounding areas and public properties free from accumulations of waste, debris, and rubbish, caused by operations.

B. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave Project Site clean and ready for occupancy.

1.02 GENERAL

A. Conduct cleaning and disposal operation in accord with legal requirements.

1. Do not burn or bury rubbish and waste materials on Project Site.

2. Do not dispose of volatile wastes in storm or sanitary drains.

B. Hazards control:

1. Store volatile wastes in covered metal containers, and remove from premises daily.

2. Prevent accumulation of wastes which create hazardous conditions.

3. Provide adequate ventilation during use of volatile or noxious substances.

Note: Care shall be taken that discharge of volatile or noxious exhaust shall be shielded from air intakes of hospital mechanical systems.

1.03 MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

1.04 DUST CONTROL

A. Clean interior spaces prior to start of finish painting, and continue cleaning as required until painting is completed.

1.05 DURING CONSTRUCTION

A. Execute cleaning daily to ensure Project Site, City's premises, adjacent and public properties are maintained free from accumulations of waste materials and rubbish.

B. Wet down dry materials and rubbish to control dust.

C. At reasonable intervals during progress of Work, clean Project Site and public properties, and dispose of waste materials, debris and rubbish.

D. Provide on Project Site dump containers for collection of waste materials, debris and rubbish. Hospital waste containers shall not be used for construction waste.

E. Remove waste materials, debris and rubbish from City's premises and legally dispose of off City's property.

F. Vacuum clean interior areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or

occupancy.

G. Handle materials in a controlled manner with as few handlings as possible. Do not drop or throw materials.

H. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

1.06 FINAL CLEANING

A. Employ experienced workers, or professional cleaners for final cleaning.

B. In preparation for Substantial Completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of accessible concealed spaces.

C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed finished surfaces; polish surfaces so designated to shine finish.

D. Repair, patch and touch up marred surfaces to specified finish, and to match adjacent surfaces.

E. Broom clean paved surfaces.

F. Keep Project clean until it is occupied by the City.

G. Clean equipment and fixtures to a sanitary condition.

H. Clean or replace, if required, filters of operating equipment.

I. Clean Debris from roofs, gutters, downspouts and drainage systems.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Salvaging and recycling nonhazardous demolition and construction waste.
2. Disposing of nonhazardous demolition and construction waste.

B. Related Sections include the following:

1. Division 01 Section "Temporary Facilities and Controls" for environmental-protection measures during construction.

1.03 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS

A. General: Develop waste management plan that results in end-of-Project rates for a minimum salvage/recycling percent by weight of total waste generated by the Work, as required by the Berkeley Municipal Code 19.37 Berkeley Green Code..

B. Salvage/Recycle Goals: Owner's goal is to salvage and recycle as much nonhazardous demolition and construction waste as possible.

1. Demolition Waste:

a. Asphaltic concrete paving.
b. Concrete.
c. Concrete reinforcing steel.
d. Brick.
e. Concrete masonry units.

f. Wood studs.
g. Wood joists.
h. Plywood and oriented strand board.
i. Wood paneling.
j. Wood trim.
k. Structural and miscellaneous steel.
l. Rough hardware.
m. Roofing.
n. Insulation.
o. Doors and frames.
p. Door hardware.
q. Windows.
r. Glazing.
s. Metal studs.
t. Gypsum board.
u. Acoustical tile and panels.
v. Carpet.
w. Carpet pad.
x. Demountable partitions.
y. Equipment.
z. Cabinets.
aa. Plumbing fixtures.
bb. Piping.
cc. Supports and hangers.
dd. Valves.
ee. Sprinklers.
ff. Mechanical equipment.
gg. Refrigerants.
hh. Electrical conduit.
ii. Copper wiring.
jj. Lighting fixtures.
kk. Lamps.
ll. Ballasts.
mm. Electrical devices.
nn. Switchgear and panelboards.
oo. Transformers.

2. Construction Waste:

a. Site-clearing waste.
b. Masonry and CMU.
c. Lumber.
d. Wood sheet materials.
e. Wood trim.
f. Metals.
g. Roofing.
h. Insulation.
i. Carpet and pad.
j. Gypsum board.
k. Piping.
l. Electrical conduit.
m. Packaging: Regardless of salvage/recycle goal indicated 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.

1.05 SUBMITTALS

A. Waste Management Plan: Submit **3** copies of plan within **7** days of date established for the Notice to Proceed.

B. See Evaluations for example of Waste Reduction Progress Reports in paragraph below.

C. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit 3 copies of report. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons
4. Quantity of waste salvaged, both estimated and actual in tons
5. Quantity of waste recycled, both estimated and actual in tons
6. Total quantity of waste recovered (salvaged plus recycled) in tons
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

D. Waste Reduction Calculations: Before request for Substantial Completion, submit **3** copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

E. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

F. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

G. 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.

H. 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.

1.06 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Green Building Professional. Waste management coordinator may also serve as Green Building coordinator.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.07 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total

quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

D.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Construction Manager. 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 Division 01 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

1. Distribute waste management plan to all relevant sub-contractor within 3 days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 01 Section "Temporary Facilities and Temporary Controls" for controlling dust and dirt, environmental protection, and noise control.

3.02 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Owner's Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area.
5. Protect items from damage during transport and storage.

C. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

3.03 RECYCLING DEMOLITION AND CONSTRUCTION **WASTE, GENERAL**

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following

The City of Berkeley Transfer Station

1201 Second Streets, Berkeley, CA

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.04 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.

B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with

other metals.

1. Clean and stack undamaged, whole masonry units on wood pallets.

D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

1. Treated Wood Waste: Treated wood waste is required to be managed, stored, transported, and disposed of as hazardous waste per California State regulations. Treated wood waste is required to be transported and disposed of at a Class I hazardous waste landfill by a Hazardous Waste contractor.

E. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.

2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

F. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

G. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

H. Plumbing Fixtures: Separate by type and size.

I. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

J. Lighting Fixtures: Separate lamps by type and protect from breakage.

K. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

L. Conduit: Reduce conduit to straight lengths and store by type and size.

3.05 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.

2. Polystyrene Packaging: Separate and bag materials.

3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.

4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees.

C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.

2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3. Treated Wood Waste: Treated wood waste is required to be managed, stored, transported, and disposed of as hazardous waste per California State regulations. Treated wood waste is required to be transported and disposed of at a Class I hazardous waste landfill by a Hazardous Waste contractor.

D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile

chipper or hammer mill. Screen out paper after grinding.

3.06 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY

A. Section describes requirements and procedures for:

1. Project cleaning.
2. Testing of equipment and systems
3. Substantial Completion
4. Final Completion
5. Close Out
6. Warranties

1.02 SUBSTANTIAL COMPLETION

A. Removal of Temporary Construction Facilities and Project Cleaning.

1. Prior to Substantial Completion inspection: remove temporary materials, equipment, services, and construction; clean all areas affected by the Work; clean and repair damage caused by installation or use of temporary facilities; restore permanent facilities used during construction to specified condition.

B. Equipment and Systems.

1. Prior to Substantial Completion, Contractor shall start up, run for periods prescribed by City, operate, adjust and balance all manufactured equipment and Project systems, including but not limited to, mechanical, electrical, safety, fire, and controls.
2. Demonstrate that such equipment and systems conform to contract standards and manufacturer's guarantees. Where applicable, use testing protocols specified, and if the contract is silent, then consistent with manufacturer's recommendations and industry standards.

C. Procedure for Substantial Completion

1. When Contractor considers Work or designated portion of the Work as Substantially Complete, submit written notice to City, with list of items remaining to be completed or corrected and explanation of why such items do not prevent City's beneficial use and occupancy of the Work for its intended purposes. Within reasonable time, City will inspect to determine status of completion.
2. Should City determine that Work is not Substantially Complete, City will promptly notify Contractor in writing, listing all defects and omissions. Contractor shall remedy deficiencies and send a second written notice of Substantial Completion. City will reinspect the Work. If deficiencies previously noted are not corrected on reinspection, then pay the cost of the reinspection.
3. When City concurs that Work is Substantially Complete, City will issue a written notice or certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified by City.
4. Manufactured units, equipment and systems that require startup must have been

started up and before a notice or certificate of Substantial Completion will be issued.

5. A punch list examination will be performed upon Substantial Completion. One follow-up review of punch list items for each discipline will be provided. If further Site visits are required to review punch list items due to incompleteness of the Work by Contractor, Contractor will reimburse City for costs associated with these visits.

1.03 FINAL COMPLETION

A. Requirements

1. Final Completion occurs when Work meets requirements for City's Final Acceptance.

B. Procedure

1. When Contractor considers Work is Finally Complete, submit written certification that:
   a. Contractor has inspected Work for compliance with Contract Documents, and all requirements for Final Acceptance have been met.
   b. Except for Contractor maintenance after Final Acceptance, Work has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected. Equipment and systems have been tested in the presence of City, and are operative.
   c. Project Record Documents are completed and turned over to City, and Work is complete and ready for final inspection.
2. In addition to submittals required by Contract Documents, provide submittals required by governing authorities and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
3. Should City determine that Work is incomplete or Defective, City promptly will so notify Contractor, in writing, listing the incomplete or Defective items. Contractor shall promptly remedy the deficiencies and notify the City when it is ready for reinspection.

C. Final Adjustments of Accounts:

1. Submit a final statement of accounting to City, showing all adjustments to the Contract Sum and complete and execute Document 00 6530 (Agreement and Release of Claims).
2. If so required, City shall prepare a final Change Order for submittal to Contractor, showing adjustments to the Contract Sum that were not previously made into a Contract Modification.

D. Warranties

1. Execute Contractor's Submittals and assemble warranty documents, and Installation, Operation, and Maintenance Manuals, executed or supplied by Subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in 8½ inches by 11 inches three-ring binder with durable plastic cover, appropriately separated and organized. Assemble in Specification Section order.
2. Submit material prior to final Application for Payment. For equipment put into use with City's permission during construction, submit within 14 calendar days after first operation. For items of Work delayed materially beyond Date of Substantial Completion, provide updated Submittal within 14 calendar days after acceptance, listing date of acceptance as start of warranty period.
3. Warranty Forms: Submit drafts to Owner for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents. Warranty shall be countersigned by manufacturers. Where specified, warranty shall be countersigned by Subcontractors and installers.

4. Rejection of Warranties: Owner reserves right to reject unsolicited and coincidental product warranties that detract from or confuse requirements or interpretations of Contract Documents.
5. Term of Warranties: For materials, equipment, systems, and workmanship, warranty period shall be one year minimum from date of Final Completion of entire Work except where:
    a. Detailed Specifications for certain materials, equipment or systems require longer warranty periods.
    b. Materials, equipment or systems are put into beneficial use of City prior to Final Completion as agreed to in writing by City.

E. Warranty of Title:

1. No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver premises, together with improvements and appurtenances constructed or placed thereon by Contractor, to City free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon premises or improvement or appurtenances thereon. Nothing contained in this paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of City.

F. Turn-In. Contract Documents will not be closed out and final payment will not be made until all keys issued to Contractor during prosecution of Work and letters from property owners, pursuant to Contract Documents, are turned in to City.

G. Release of Claims. Contract Documents will not be closed out and final payment will not be due or made until Document 00 6530 (Agreement and Release of Claims) is completed and executed by Contractor and City.

H. Fire Inspection Coordination. Coordinate fire inspection and secure sufficient notice to City to permit convenient scheduling (if applicable).

I. Building Inspection Coordination**.** Coordinate with City a final inspection for the purpose of obtaining an occupancy certificate (if applicable).

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7800

CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. This section specifies administrative and procedural requirements for Project Record Documents.

B. Project Record Documents required include:

1. Marked-up copies of Contract Drawings
2. Marked-up copies of Shop Drawings
3. Newly prepared Drawings
4. Marked-up copies of Specifications, Addenda and Change Orders
5. Marked-up Project Data submittals
6. Record Samples
7. Field records for variable and concealed conditions
8. Record information on Work that is recorded only schematically

C. Specific Project Record Documents requirements that expand requirements of this Section are included in the individual Sections of Divisions 1 through 33.

D. General Project closeout requirements are included in Section 01 7700, "Contract Closeout."

E. Maintenance of Documents and Samples:

1. Store Project Record Documents and samples in the field office apart from Contract Documents used for construction.
2. Do not permit Project Record Documents to be used for construction purposes.
3. Maintain Project Record Documents in good order, and in a clean, dry, legible condition.
4. Make documents and samples available at all times for inspection by Architect and Project Manager.

F. City will provide one set of sepias and one blueline set of the construction drawings and one project manual for the Contractor's use and copying during construction.

1.02 PROJECT RECORD DRAWINGS

A. Mark-up Procedure: During the construction period, maintain a set of blueline or blackline prints of Contract Drawings and Shop Drawings for Project Record Document purposes. Label each document (on first sheet or page) "PROJECT RECORD" in 2 in. high printed letters. Keep record documents current. Note: A reference by number to a Change Order, RFI, RFQ, Field Order or other such document is not acceptable as sufficient record information on any record document. Do not permanently conceal any Work until required information has been recorded.

1. Mark these Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to

information on concealed elements which would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:

a. Dimensional changes to the Drawings
b. Revisions to details shown on the Drawings
c. Depths of various elements of foundation in relation to main floor level or survey datum.
d. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
e. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
f. Establish locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, and similar items.
g. Provide actual numbering of each electrical circuit.
h. Field changes of dimension and detail.
i. Revisions to routing of piping and conduits
j. Revisions to electrical circuitry
k. Actual equipment locations
l. Duct size and routing
m. Changes made by Change Order
n. Details not on original Contract Drawings

2. Mark completely and accurately Project Record Drawing prints of Contract Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.

3. Mark Project Record Drawing sets with red erasable colored pencil; use other colors to distinguish between changes for different categories of the Work at the same location.

4. Mark important additional information which was either shown schematically or omitted from original Drawings.

5. Note construction change directive numbers; alternate numbers; Change Order numbers and similar identification.

6. Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings.

a. Accurately record information in an understandable and legible drawing technique.
b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.

B. Preparation of Transparencies: Immediately prior to inspection for Certification of Substantial Completion, review completed marked-up Project Record Drawings with the Project Manager**]**. When authorized, prepare a full set of correct transparencies of Contract Drawings and Shop Drawings.

1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation "PROJECT RECORD DRAWINGS" in a prominent location on each Drawing.

2. Refer instances of uncertainty to the Project Manager for resolution.

3. Review of Transparencies: Before copying and distributing, submit corrected

transparencies and the original marked-up prints to the Project Manager and Architect/Engineer for review.

a. Transparencies and the original marked-up prints will be returned to the Contractor for organizing into sets, printing, binding, and final submittal.

4. Copies and Distribution: After completing the preparation of transparency Project Record Drawings, print three blue-line or black-line prints of each Drawing, whether or not changes and additional information were recorded. Organize the copies into manageable sets. Bind each set with durable paper cover sheets, with appropriate identification, including titles, dates and other information on cover sheets.

a. Organize and bind original marked-up set of prints that were maintained during the construction period in the same manner.
b. Organize Project Record Drawings transparencies into sets matching the print sets. Place these sets in durable tube-type drawing containers with end caps. Mark the end cap of each container with suitable identification.

C. Distribution of Marked up Drawings and Transparencies

1. Submit the marked-up Project Record Drawings set, pdfs, transparencies, and five copy sets to the Project Manager for City's records.

D. Shop Drawings and Samples: Maintain as record documents; legibly annotate Shop Drawings and Samples to record changes made after review.

E. In addition to requirements of this Section, comply with supplemental requirements of Divisions 21 and 28 and Division 33.

1. Divisions 21 through 28 and Division33 of the specifications require the preparation of large scale, detailed Layout Drawings of the work of those divisions. These Layout Drawings are not shop drawings as defined by the General Conditions, but together with shop drawing or Layout Drawings of all other affected sections are used check, coordinate and integrate the work of the various sections

2. Include these Layout Drawings as part of the As Built Documents.

F. Delete Architect/Engineer title block and seal from documents.

G. As-Built Documents are subject to review and acceptance by the City and Architect/Engineer.

H. Submit documents to Project Manager with final Application for payment.

1.03 PROJECT RECORD SPECIFICATIONS

A. During the construction period, maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.

1. Mark the Project Record Specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, change order work, and information on concealed installation that would be difficult to identify or measure and record later.

a. In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
b. Record the name of the manufacturer, catalog number, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with Project Record Product Data submittals and maintenance manuals.

c. Note related Project Record Product Data, where applicable, for each principal product specified, indicate whether Project Record Product Data has been submitted in maintenance manual instead of submitted as Project Record Product Data.

2. Upon completion of mark-up, submit Project Record Specifications to the Project Manager for City's records.

1.04 PROJECT RECORD PRODUCT DATA

A. During the construction period, maintain one copy of each Project Record Product Data submittal for Project Record Document purposes.

1. Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the site, and changes in manufacturer's instructions and recommendations for installation.

2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

3. Note related Change Orders and mark-up of Project Record Drawings, where applicable.

4. Upon completion of mark-up, submit a complete set of Project Record Product Data to the Project Manager for City's records.

5. Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.

6. Each prime Contractor is responsible for mark-up and submittal of record Project Record Product Data for its own Work.

B. Material, Equipment and Finish Data

1. Provide data for primary materials, equipment and finishes as required under each specification section.

2. Submit two sets prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers; provide typewritten table of contents for each volume.

3. Arrange by Specification division and give names, addresses, and telephone numbers of subcontractors and suppliers. List:

a. Trade names.
b. Model or type numbers.
c. Assembly diagrams.
d. Operating instructions.
e. Cleaning instructions.
f. Maintenance instructions.
g. Recommended spare parts.
h. Product data.

1.05 MISCELLANEOUS PROJECT RECORD SUBMITTALS

A. Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Project Manager for City's records. Categories of requirements resulting in miscellaneous records include, but are not limited to the following:

1. Field records on excavations and foundations
2. Field records on underground construction and similar work
3. Survey showing locations and elevations of underground lines
4. Invert elevations of drainage piping
5. Surveys establishing building lines and levels
6. Authorized measurements utilizing unit prices or allowances
7. Records of plant treatment
8. Ambient and substrate condition tests
9. Certifications received in lieu of labels on bulk products
10. Batch mixing and bulk delivery records
11. Testing and qualification of tradespersons
12. Documented qualification of installation firms
13. Load and performance testing
14. Inspections and certifications by governing authorities
15. Leakage and water-penetration tests
16. Fire resistance and flame spread test results
17. Final inspection and correction procedures

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 RECORDING

A. Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project. City may review Project Record Documents prior to each progress payment to see that the required information is being properly and faithfully recorded to assure compliance with this requirement. If Contractor has not complied with this requirement, the progress payment will be withheld until the Record Documents have been brought up to date.

3.02 SUBMITTAL

A. At completion of Project, deliver Record Documents to Project Manager.

B. Accompany submittal with transmittal letter containing:

1. Date
2. Project title and number
3. Contractor's name and address
4. Number and title of each record documents
5. Certification that each document as submitted is complete and accurate, and signature of Contractor, or his authorized representative.

END OF SECTION

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END OF SECTION

SECTION 01 73 29 - CUTTING, PATCHING AND ALTERATION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work..

C. Cutting and patching.

D. Cleaning and protection.

1.02 RELATED REQUIREMENTS

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

B. Section 02 41 13 - Selective Demolition: Demolition of portions of existing building as indicated.

C. Individual Product Specification Sections:

1. Advance notification to other sections of openings required in work of those sections.

2. Limitations on cutting structural members.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022.

1.04 SUBMITTALS

A. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:

1. Structural integrity of any element of Project.

2. Integrity of weather exposed or moisture resistant element.

3. Efficiency, maintenance, or safety of any operational element.

4. Visual qualities of sight exposed elements.

5. Work of Owner or separate Contractor.

6. Include in request:

a. Identification of Project.

b. Location and description of affected work.

c. Necessity for cutting or alteration.

d. Description of proposed work and products to be used.

e. Effect on work of Owner or separate Contractor.

f. Written permission of affected separate Contractor.

g. Date and time work will be executed.

1.05 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.

2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.

D. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

E. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

A. See Section 01 11 00 - Summary of Work for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements , with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize

spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean-up of work of separate sections.

H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.

2. Report discrepancies to Architect before disturbing existing installation.

3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.

1. Provide, erect, and maintain temporary dustproof partitions.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.

1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.

2. Remove items indicated on drawings.

3. Relocate items indicated on drawings.

4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.

5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.

2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.

3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

a. Disable existing systems only to make switchovers and connections; minimize duration of outages.

b. Provide temporary connections as required to maintain existing systems in service.

4. Verify that abandoned services serve only abandoned facilities.

5. Remove abandoned pipe, ducts, conduits, and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

F. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.

2. Perform cutting to accomplish removals neatly and as specified for cutting new work.

3. Repair adjacent construction and finishes damaged during removal work.

G. Adapt existing work to fit new work: Make as neat and smooth a transition as possible.

1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:

1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.

2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:

1. Complete the work.

2. Fit products together to integrate with other work.

3. Provide openings for penetration of mechanical, electrical, and other services.

4. Match work that has been cut to adjacent work.

5. Repair areas adjacent to cuts to required condition.

6. Repair new work damaged by subsequent work.

7. Remove samples of installed work for testing when requested.

8. Remove and replace defective and non-complying work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material , to full thickness of the penetrated element.

J. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

2. Match color, texture, and appearance.

3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.

G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

H. Prohibit traffic from landscaped areas.

I. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect and Owner seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.09 DEMONSTRATION AND INSTRUCTION

A. See Section 01 - Closeout Procedures

B. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

END OF SECTION

SECTION 02 40 00

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. Removing above-grade site improvements within limits indicated.

B. Disconnecting, capping or sealing, and abandoning site utilities in place.

C. Disconnecting, capping or sealing, and removing site utilities.

D. Disposing, recycling, reusing, and/or salvaging of objectionable material.

1.3 RELATED SECTIONS

A. Section 31 20 00 – Earth Moving.

1.4 DEFINITIONS

A. ANSI: American National Standards Institute.

B. CAL-OSHA: California Occupational Safety and Health Administration.

1.5 SUBMITTALS

A. Follow Submittal procedure outlined in Section 01 33 00 – Submittal Procedures.

1.6 PROJECT CONDITIONS

A. Except for materials indicated to be stockpiled or to remain the Owner’s property, cleared materials are the Contractor's property. Remove cleared materials from site and dispose, recycle, reuse, and/or salvage the materials in a lawful manner.

B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store where indicated on plans or where designated by the Owner. Avoid damaging materials designated for salvage.

C. Unidentified Materials: If unidentified materials are discovered, including hazardous materials that will require additional removal other than is required by the Contract

Documents, immediately report the discovery to the Owner. If necessary, the Owner will arrange for any testing or analysis of the discovered materials and will provide instructions regarding the removal and disposal of the unidentified materials.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Backfill excavations resulting from demolition operations with on-site or import materials conforming to backfill material requirements in Section 31 20 00 Earth Moving.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points during construction.

B. Protect existing site improvements to remain during construction.

C. Clear the site of any existing pavements, vegetation, organic topsoil, debris, existing undocumented loose or soft fill, and other deleterious material within the proposed improvement areas. Removed fill soil may be evaluated by the field Geotechnical Engineer for possible reuse and placement as engineered fill. Holes resulting from the removal of underground obstructions extending below the proposed finish grade should be cleared and backfilled with properly compacted engineered fill or other material approved by the field Geotechnical Engineer. Backfilling operations for any excavations to remove deleterious material should be carried out under the observation of the field Geotechnical Engineer.

3.2 RESTORATION

A. Restore damaged improvements to their original condition, as acceptable to the City of Berkeley.

3.3 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed or abandoned.

B. Arrange to shut off indicated utilities with utility companies or verify that utilities have been shut off.

C. Existing Utilities: If encountered, do not interrupt utilities serving facilities occupied by City of Berkeley or others unless authorized in writing by the City of Berkeley, and then only after arranging to provide temporary utility services according to requirements indicated. Utility pipelines less than four inches in diameter to be abandoned may be left in place provided the will not be in close proximity to new foundation elements or interfere with new utilities. Said pipes should be plugged at the ends with concrete or sand-cement slurry. Larger utility pipelines or pipelines that underlie new foundations

should be removed and replaced with engineered fill, or left in place and completely grouted with flowable sand-cement slurry or other approved Controlled Density Fill.

D. Coordinate utility interruptions with utility company affected.

E. Do not proceed with utility interruptions without the permission of the City of Berkeley and utility company affected. Notify City of Berkeley and utility company affected two working days prior to utility interruptions.

F. Excavate and remove underground utilities that are indicated to be removed

G. Securely close ends of abandoned piping with tight fitting plug or wall of concrete minimum 6-inches thick.

3.4 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, and gutters, as indicated. Where concrete slabs, curb, gutter and asphalt pavements are designated to be removed, remove bases and subbase to surface of underlying, undisturbed soil.

C. Unless the existing full-depth joints coincide with line of pavement demolition, neatly saw-cut to full depth the length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

D. Remove driveways, curbs, gutters and sidewalks by saw cutting to full depth. If saw cut falls within 30-inches of a construction joint, expansions joint, score mark or edge, remove material to joint, mark or edge.

3.5 BACKFILL

A. Place and compact material in excavations and depressions remaining after site clearing in conformance with Section 31 20 00 Earth Moving.

3.6 DISPOSING

A. Remove surplus obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off the City of Berkeley's property. In addition to disposing the materials, consider recycling or donating/selling the materials to a reuse organization within 1000 miles.

END OF SECTION

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SECTION 02 41 13 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Selective demolition of building elements as indicated.
2. Pollutant control measures.
3. Protection of existing building finishes during demolition and construction, including, but not limited to, wood paneling and trim.
4. Protection of fixed casework, audience seating, lockers, and similar elements not indicated to be removed.
5. Construction waste reduction, disposal, and recycling including required documentation for Construction Waste Management Plan and its implementation.

B. Related Sections

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
2. Section 01 11 00 - NTU Summary of Work: For items to be salvaged.
3. Section 01 74 19 - NTU Construction Waste Management and Disposal: For procedures and documentation associated with demolition waste.
4. Division 21 - Fire Suppression: For demolition requirements as specified and as indicated on the Drawings.
5. Division 22 - Plumbing: For demolition requirements as specified and as indicated on the Drawings.
6. Division 23 - Heating, Ventilating, and Air Conditioning (HVAC): For demolition requirements as specified and as indicated on the Drawings.
7. Division 26 - Electrical: For demolition requirements as specified and as indicated on the Drawings.
8. Division 27 - Communications: For demolition requirements as specified and indicated on the Drawings.
9. Division 28 - Electronic Safety and Security: For demolition requirements as specified and as indicated on the Drawings.
10. Division 31 - Earthwork: For demolition of pavement and site improvements as specified and indicated on the Drawings.

1.02 REFERENCES

A. ANSI/ASSE - American National Standards Institute/American Society of Safety Engineers

1. A10.6 - Safety Requirements for Demolition Operations.

B. EPA - Environmental Protection Agency

C. NFPA - National Fire Protection Association

1. 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.03 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.

1. Storage or sale of removed items or materials on-site is not permitted.

B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to the Owner's designated storage area.

C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.

D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, at the Contractor's option and at no additional cost, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

E. Materials Ownership: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

1.04 SUBMITTALS

A. CALGreen submittals: Refer to Section 01 74 19 - NTU Construction Waste Management and Disposal for planning and documentation of construction waste resulting from demolition activities.

1. Construction Waste Management Plan: Prepare and submit in accordance with CALGreen requirements.

2. Construction Waste Management Worksheets: Prepare and submit in accordance with CALGreen requirements.

3. Construction Waste Management Acknowledgment: Prepare and submit in accordance with CALGreen requirements.

B. Schedule of selective demolition activities indicating the following:

1. Interruption of utility services and security devices.

2. Coordination for shutoff, capping, and continuation of utility services and security devices.

3. Locations of temporary barricades, partitions, and means of egress.

4. Above items shall be shown on Preliminary schedule, Final Schedule, and 3-week look aheads. Final dates of shutdowns are required no less than 10 days prior to activity in a request to Program Manager in writing.

C. Construction Logistics Plan indicating the following:

1. Barricades and enclosures.

2. Laydown and staging area.

D. Inventory of items to be removed and salvaged.

E. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.

1. Wood paneling, ceilings, soffits, and trim not indicated to be removed.

F. Record Drawings at Project Closeout: Identify and accurately locate capped utilities and other subsurface structural, electrical, plumbing, mechanical and security devices.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements

1. Comply with governing EPA notification regulations before beginning selective demolition.

2. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

C. Predemolition Conference: Conduct conference at Project site.

1.06 PROJECT CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by the Owner as far as practical.

B. Portions of site immediately adjacent to selective demolition area will be occupied. Conduct selective demolition so Owner's operations will not be disrupted.

C. Asbestos: If any previously unidentified materials suspected of containing asbestos are encountered, do not disturb the materials. Immediately notify the Architect and the Owner.

1.07 WARRANTIES

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped where indicated.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

1. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated plumbing, mechanical, electrical, security, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.

E. Survey the condition of the buildings to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structures during selective demolition.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized by the Owner. Provide temporary services during interruptions to existing utilities, as acceptable to the Owner and to governing authorities.

a. Provide not less than 10 calendar days' notice to the Owner if shutdown of service is required during changeover.

2. Sitework will affect existing irrigation services. Provide not less than 72 hours' notice to the Owner when shutdown of irrigation service is required during sitework. Temporarily reconnect irrigation service to maintain irrigation in operation during construction.

B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving portions of the buildings or sitework to be selectively demolished.

1. Arrange to shut off indicated utilities with the Owner.

2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.

3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

3.03 PREPARATION

A. Conduct demolition operations and remove debris to ensure minimum interference with 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 the Owner and authorities having jurisdiction.

B. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by the Owner.

2. Protect existing site improvements, appurtenances, and landscaping to remain.

3. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces to ensure that no water leakage or damage occurs to structure or interior areas.

4. Protect walls, ceilings, floors, fixed audience seating, and other existing finish work that are to remain and are exposed during selective demolition and construction operations.

a. Exercise care to protect existing wood paneling and ceilings to remain.

5. Cover and protect furniture, furnishings, and equipment that have not been removed.

C. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

1. Construct dustproof partitions of not less than nominal 4-inch studs and 1/2-inch fire retardant plywood on the demolition side; seal joints and perimeter.

2. Non-plastic sheet materials shall be used to further mitigate dust and shall not trap moisture; seal to prevent dust penetration.

D. Provide and maintain interior and exterior bracing or structural support to preserve stability and prevent movement, settlement, or collapse of portions of building to be selectively demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, 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.

3.04 POLLUTANT CONTROLS

A. CALGreen Requirements: Refer to Section 01 81 13 - NTU Sustainable Design Requirements for requirements for temporary ventilation and pollutant control.

1. Comply with CALGreen 5.504.3 regarding covering of duct openings and protection of mechanical equipment during construction.

2. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, temporary or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

3. Comply with SMACNA Indoor Air Quality (IAQ) Guideline for Occupied Buildings under Construction if permanent heating, cooling, and ventilating systems are in use during selective demolition operations.

B. Use temporary enclosures and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.

D. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to the condition existing before start of selective demolition.

3.05 SELECTIVE DEMOLITION

A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to 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. To minimize disturbance of adjacent surfaces, use hand 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. Maintain portable fire suppression devices during flame-cutting operations.

5. Maintain adequate ventilation when using cutting torches.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

8. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

9. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

10. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

B. Demolish concrete in small sections. Cut concrete at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.

3.06 MANAGEMENT OF DEMOLISHED MATERIALS

A. Recycle and/or salvage for reuse non-hazardous demolition waste in accordance with requirements of Section 01 74 19 - NTU Construction Waste Management and Disposal. Remove from site all materials not to be reused on site.

B. Store items to be salvaged and reinstalled in a secure and protected location until ready for reinstallation.

C. Burning: Do not burn demolished materials.

D. Refer to the Division 01 for procedures to follow when materials containing asbestos and lead are encountered.

3.07 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.

B. Return adjacent areas to condition existing before selective demolition operations began.

C. Sweep the building broom clean on completion of selective demolition operation.

END OF SECTION

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SECTION 03 05 16 - UNDERSLAB VAPOR RETARDER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet vapor barrier under concrete slabs on grade in areas of new work where existing concrete slab sections are removed and replaced.

1.02 RELATED REQUIREMENTS

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

B. Section 09 05 61 - NTU Common Work Results for Flooring Preparation: Preparation of concrete floor substrates to receive floor finishes.

1.03 REFERENCE STANDARDS

A. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs 2018a.

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs 2017.

1.04 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

B. Product Data: Submit manufacturers' data on manufactured products.

C. Test Data: Submit report of tests showing compliance with specified requirements.

D. Samples: Submit samples of underslab vapor barrier to be used.

E. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Underslab Vapor Barrier:

1. Water Vapor Permeance: Not more than 0.010 perms, maximum as tested in accordance with mandatory conditioning tests per ASTM E1745

2. Strength: Complying with ASTM E1745 Class A.

3. Thickness: 15 mils.

4. Basis of Design:

   a. Stego Industries LLC; Stego Wrap Vapor Barrier (15-mil): www.stegoindustries.com/#sle.

5. Acceptable Alternative:

   a. Henry Corporation: Moistop Ultra 15 (15-mil).

   b. W.R. Meadows: Perminator Class A (15 mil)

B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams, perimeter edges, and penetrations in vapor barrier.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surface over which vapor barrier is to be installed is complete and ready before proceeding with installation of vapor barrier.

B. Ensure that subgrade is level and compacted in accordance with requirements of the Geotechnical report and approved by Architect or Geotechnical Engineer.

3.02 INSTALLATION

A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.

B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls, terminating at the top of the slab.

C. Lay vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.

D. Extend vapor barrier to the perimeter of the slab.

E. Lap joints minimum 6 inches.

F. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

G. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.

H. Repair damaged vapor retarder before covering with other materials.

END OF SECTION

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel and aluminum items.

B. Miscellaneous Framing Accessories:

C. Playground Fencing

D. Counter Support Brackets

1.02 RELATED REQUIREMENTS

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

B. See Structural Drawings and Specifications for Cast-In-Place Concrete: Placement of metal fabrications in concrete.

C. Section 06 20 00 - NTU Finish Carpentry

D. Section 09 90 00 - NTU Painting and Coating: Field-applied paint finishes.

E. Section 09 30 00 - Tiling

F. Section 22 42 16 - Cast Concrete Lavatory

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.

B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2021.

C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2021, with Errata (2022).

D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2020, with Errata (2022).

E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

H. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.

I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.

J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

L. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

M. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes 2019a.

N. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire 2019.

O. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2021a.

P. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

Q. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2021.

R. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.

S. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2021).

T. AWS D1.2/D1.2M - Structural Welding Code - Aluminum 2014, with Errata (2020).

U. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.

V. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

W. SSPC-SP 2 - Hand Tool Cleaning 2018.

1.04 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.

B. Shop Drawings for playground fence: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths and weld locations.

C. Provide templates for anchors and bolts specified for installation under other Sections.

D. Where concrete inserts are required, show size and locations required.

1.05 QUALITY ASSURANCE

A. Design Criteria

1. Work shall be designed to support normally imposed loads and conform to AISC requirements.

2. Built-up parts shall not exhibit warp

B. Welding Standards: Comply with applicable provisions of AWS D1.1 and AWS D1.3.

1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.

F. Slotted Channel Fittings: ASTM A1011/A1011M.

G. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.

H. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

I. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

J. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

K. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction, including CALGreen.

L. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction, including CALGreen.

2.02 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.

D. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.

E. Bolts, Nuts, and Washers: Stainless steel.

F. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.03 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED ITEMS

A. Sink Supports Attached to Structural Framing: For support of cast stone countertops; prime paint finish: Rakks EH series sink bracket, modify brackets as needed for cast-sink installation. Install at 30-inches on center or as recommended by cast stone sink manufacturer.

2.05 FINISHES - STEEL

A. Prime paint steel items.

1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry, and all exterior items.

2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

1. Primer for Interior and Exterior Ferrous, Non-Ferrous, Galvanized Metal, and Aluminum Primer: Factory-formulated acrylic water-based rust-inhibitive metal primer. Apply at a dry film thickness of not less than 2.2 mils.

a. Basis of Design: PPG Paints; 4020 PF Series Pitt-Tech Plus Interior/Exterior DTM Industrial Primer (91 g/L VOC).

2. Primer for Items Indicated to Receive High Performance Coating: Shop-apply; ramp and stair handrails at entry.

a. Basis of Design: PPG Amercoat 68HS Zinc Rich Epoxy.

E. Galvanizing is required for steel playground fence components: Galvanize after fabrication to ASTM A123/A123M requirements.

2.06 FINISHES - ALUMINUM

A. Exterior Aluminum Surfaces: Class I color anodized.

B. Interior Aluminum Surfaces: Class I natural anodized.

C. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

D. Class II Natural Anodized Finish: AAMA 611 AA-M12C22A31 Clear anodic coating not less than 0.4 mils thick.

E. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick; light bronze.

F. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick; light bronze.

G. Class II Color Anodized Finish: AAMA 611 AA-M12C22A32 Integrally colored anodic coating not less than 0.4 mils thick; light bronze.

H. Class II Color Anodized Finish: AAMA 611 AA-M12C22A34 Electrolytically deposited colored anodic coating not less than 0.4 mils thick; light bronze.

I. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish; color as indicated.

J. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system; color as indicated.

1. Manufacturers:

a. Sherwin-Williams Company; POLANE Solar Reflective 2K Urethane Enamel: oem.sherwin-williams.com/#sle.

K. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system; color as indicated.

1. Manufacturers:

a. Sherwin-Williams Company; Fluropon: www.coil.sherwin.com/#sle.

L. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.07 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

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SECTION 06 20 00 - FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior Finish Carpentry

B. Exterior Finish Carpentry

C. Wood casings and moldings.

D. Plywood backboard for telecommunications equipment.

1.02 RELATED REQUIREMENTS

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

B. Section 08 14 16 - Flush Wood Doors.

C. Section 08 80 00 - Glazing

D. Section 09 90 00 - Painting and Coating: Field finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.

B. ANSI A135.4 - Basic Hardboard 2012 (Reaffirmed 2020).

C. ANSI A208.1 - American National Standard for Particleboard 2016.

D. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015 (Reaffirmed 2020).

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

G. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).

H. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards 2021, with Errata.

I. AWPA U1 - Use Category System: User Specification for Treated Wood 2021.

J. BHMA A156.9 - Cabinet Hardware 2020.

K. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood 2020.

L. PS 1 - Structural Plywood 2009 (Revised 2019).

M. WI (CCP) - Certified Compliance Program (CCP) Current Edition.

N. WI (CSIP) - Certified Seismic Installation Program (CSIP) Current Edition.

1.04 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.

3. Product Data for CALGreen 5.504.4.5 – Composite Wood Products: For composite-wood products, showing requirements for formaldehyde as specified in Table 5.504.4.

4. Refer to Section 01 81 13 - NTU Sustainable Design Requirements: Requirements for certified wood and low-emitting materials.

B. Product Data:

1. Provide manufacturer's product data, storage and handling instructions for factory-fabricated units.

2. Provide data on fire retardant treatment materials and application instructions.

3. Provide instructions for attachment hardware and finish hardware.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

2. Include certification program label.

D. Samples: Submit two samples of wood trim 12-inch long.

E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

F. Manufacturer's Instructions: Provide manufacturer's installation instructions for factory-fabricated units.

1.05 QUALITY ASSURANCE

A. Forest Stewardship Council (FSC) Certified Products:

1. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

2. Forest Certification: Provide components made with not less than 50 percent of wood products obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with a minimum of five years of documented experience.

1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

C. Quality Certification:

1. Comply with WI (CCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section www.woodworkinstitute.com/#sle.

D. Provide labels or certificates indicating that the work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.

1. Provide designated labels on shop drawings as required by certification program.

2. Provide designated labels on installed products as required by certification program.

3. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-fabricated units to project site in original packages, containers or bundles bearing brand name and identification.

B. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

C. Protect from moisture damage.

D. Handle materials and products to prevent damage to edges, ends, or surfaces.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

C. Exterior Woodwork Items:

1. Soffits, Trim, Window Casings, Moldings and Fascias: Redwood or Western Red Cedar; prepare for opaque finish. Option to use fiber-cement or poly-ash trim in dimensions to match existing wood trim approved by Architect/Owner.

D. Interior Woodwork Items:

1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.

2. Moldings, Bases, Casings, and Miscellaneous Trim for Transparent Finish: Clear Douglas fir or cedar; prepare for transparent finish.

2.02 SUSTAINABILITY CHARACTERISTICS

A. Provide composite wood products complying with composite wood indoor emission requirements per CalGreen requirements.

2.03 LUMBER MATERIALS

A. Softwood Lumber: pre-finished pine, sawn, maximum moisture content of 6 percent; of quality suitable for opaque finish.

B. Hardwood Lumber: oak species, maximum moisture content of 6 percent; of quality suitable for transparent finish.

2.04 SHEET MATERIALS

A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

B. Softwood Plywood, Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

1. Grading: Certified by the American Plywood Association.

C. Softwood Plywood, Exposed to View: A-C Grade, plain sawn, veneer core, glue type as recommended for application.

1. Grading: Certified by the American Plywood Association.

2. Face Veneer: APA PRP-108 Group 2; Port Orford Cedar or Western Hemlock; sanded.

D. Softwood Plywood, [for telecommunications backboards]: [3/4 inch AC Grade], veneer core, fire retardant treated and pre-painted.

1. Grading: Certified by the American Plywood Association.

E. Hardwood Plywood: Face species as indicated, plain sawn, book matched, medium density fiberboard core; HPVA HP-1 Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.

F. Particleboard: ANSI A208.1 Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.

G. Hardboard: ANSI A135.4 Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side (S1S).

2.05 FASTENINGS

A. Refer to Section 01 81 13 - NTU Sustainable Design Requirements: Requirements for requirements for low-emitting materials.

B. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

C. Adhesive for factory-fabricated units: Manufacturer's recommended adhesive for application.

D. Fasteners: Of size and type to suit application; stainless steel finish in concealed locations and in exposed locations.

E. Fasteners for Exterior Applications: Stainless steel; length required to penetrate wood substrate 1-1/2 inch minimum.

F. Concealed Joint Fasteners: Threaded steel.

2.06 ACCESSORIES

A. Lumber for Shimming and Blocking: Softwood lumber of any species.

B. Plastic Edge Trim: Extruded convex shaped; smooth finish; self-locking serrated tongue; of width to match component thickness and color.

C. Aluminum Edge Trim: Extruded convex shape; smooth surface finish; self-locking serrated tongue; of width to match component thickness; natural mill finish. Provide profiles as indicated on drawings and as required to neatly trim exposed edges.

D. Miscellaneous Aluminum Trim Profiles: As indicated on drawing details. Fry Reglet, or equal; clear anodized aluminum.

E. Glass: See Section 08 80 00 - Glazing.

1. Safety Glass: ASTM C1048, fully tempered; clear; 1/8 inch thick, minimum.

2. Safety Glass: Laminated glass complying with 16 CFR 1201 and ANSI Z97.1; clear; nominally 6 mm thick.

F. Primer: For factory-primed units, manufacturer's recommended primer, conforming to specified VOC limits.

G. Wood Filler: Oil base, tinted to match surface finish color.

2.07 HARDWARE

A. Hardware: Comply with BHMA A156.9.

2.08 WOOD TREATMENT

A. Factory-Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for pressure impregnated wood treatments determined by use categories, expected service conditions, and specific applications.

B. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.

C. Wood Preservative by Pressure Treatment (PT Type): Provide AWPA U1 treatment using waterborne preservative with 0.25 percent retainage.

D. Shop pressure treat wood materials requiring fire rating to concealed wood blocking.

E. Provide identification on fire retardant treated material.

F. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

G. Redry wood after pressure treatment to maximum 8 percent moisture content.

2.09 SITE FINISHING MATERIALS

A. Field Finishing: As specified in Section 09 90 00 - NTU Painting and Coating.

B. Exterior Wood Sill treatment: Smith and Company Restoration Products, smithandcompany.org, 1-800-234-0330. Used for courtyard windowsills. Restoration products installed per manufacturer's instructions.

1. Smith's Clear Penetrating Epoxy Sealer
2. Smith's Restoration Kits
3. Smith's Epoxy Filler
4. Smith's Multi-Wood Primer

2.10 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. Shop prepare and identify components for book match grain matching during site erection.

C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.11 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

1. Transparent:

a. System - 1, Lacquer, Nitrocellulose.

b. Stain: As selected by Architect.

c. Sheen: Flat.

2. Opaque:

a. System - 1, Lacquer, Nitrocellulose.

b. Color: As selected by Architect.

c. Sheen: Flat.

E. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

C. Prepare existing courtyard wood windowsills to receive restoration products per manufacturer's recommendations.

3.02 INSTALLATION

A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Install factory-fabricated units in accordance with manufacturer's printed installation instructions.

C. Set and secure materials and components in place, plumb and level.

D. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply one coat of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.

C. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09 90 00 - NTU Painting and Coating.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.05 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 06 83 16 - FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass reinforced plastic panels for Janitor Closet.

B. Trim.

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

A. 9 CFR 416.2 - Regulatory Requirements Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, Part 416-Sanitation current edition.

B. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor 2013a.

C. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2021.

D. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels 2017.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

1.04 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Samples: Submit two samples 6 inch by 6 inch in size illustrating material and surface design of panels.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fiberglass Reinforced Plastic Panels:

1. Crane Composites, Inc; "Varietex": www.cranecomposites.com/#sle. "Varietex", Class A FRP panel, color to be selected. For Janitor Closet. Provided with trims, closure and transition pieces as needed for a water-proof installation.

2. Or approved equal.

2.02 PANEL SYSTEMS

A. Wall Panels:

1. Panel Size: 4 by 8 feet.

2. Panel Thickness: 0.10 inch.

3. Surface Design: Smooth.

4. Color: As selected by Architect.

5. Attachment Method: Adhesive only, with trim and sealant in joints.

2.03 MATERIALS

A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.

1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.

2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

3. Scratch Resistance: Barcol hardness score greater than 35, when tested in accordance with ASTM D2583.

4. Sanitation and Cleanability: Comply with 9 CFR 416.2.

B. Trim: Vinyl; color coordinating with panel.

C. Fasteners: Nylon rivets.

D. Adhesive: Type recommended by panel manufacturer.

E. Sealant: Type recommended by panel manufacturer; color matching panel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS

A. Install panels in accordance with manufacturer's instructions.

B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.

C. Pre-drill fastener holes in panels, 1/8 inch greater in diameter than fastener, spaced as indicated by panel manufacturer.

D. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.

E. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.

F. Install panels with manufacturer's recommended gap for panel field and corner joints.

G. Drive fasteners to provide snug fit, and do not over-tighten.

H. Place trim on panel before fastening edges, as required.

I. Fill channels in trim with sealant before attaching to panel.

J. Install trim with adhesive and screws or nails, as required.

K. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.

L. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION

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SECTION 07 13 00 - SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Self-adhered modified bituminous sheet membrane.

B. Self-adhered HDPE sheet membrane.

C. PMMA-Based flashing at steel column bases below exterior pavement.

1.02 RELATED REQUIREMENTS

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

B. Section 07 21 00 - NTU Thermal Insulation: Insulation used for protective cover.

C. Section 07 62 00 - NTU Sheet Metal Flashing and Trim: Metal parapet, coping, and counterflashing.

1.03 ABBREVIATIONS

A. HDPE - High-Density Polyethylene.

B. NRCA - National Roofing Contractors Association.

C. PMMA - Polymethyl-Methacrylate

1.04 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension 2016 (Reapproved 2021).

B. ASTM D570 - Standard Test Method for Water Absorption of Plastics 1998 (Reapproved 2018).

C. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting 2018.

D. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds 1998 (Reapproved 2017).

E. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test) 2008, with Editorial Revision (2015).

F. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2021.

G. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes 2020.

H. ASTM D6506/D6506M - Standard Specification for Asphalt Based Protection Board for Below-Grade Waterproofing 2001, with Editorial Revision (2018).

I. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022.

J. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover 2008a (Reapproved 2019).

K. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems 2014, with Editorial Revision (2017).

L. NRCA (WM) - The NRCA Waterproofing Manual 2021.

1.05 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

B. Product Data: Provide data for membrane, surface conditioner, and joint and crack sealants.

C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.

D. Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate special procedures.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

1.08 WARRANTY

A. Contractor to correct defective Work within period of five years after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.

PART 2 PRODUCTS

2.01 PRODUCT REQUIREMENTS

2.02 SHEET WATERPROOFING MATERIALS

A. Self-Adhered Modified Bituminous Sheet Membrane:

1. Thickness: 60 mil, 0.060 inch, minimum.

2. Sheet Width: 36 inches, minimum.

3. Tensile Strength:

   a. Film: 5,000 psi, minimum, measured in accordance with ASTM D882 and at grip-separation rate of 2 inches per minute.

   b. Membrane: 325 psi, minimum, measured in accordance with ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches per minute.

4. Elongation at Break: 300 percent, minimum, measured in accordance with ASTM D412.

5. Water Vapor Permeance: <0.1 perm, maximum, measured in accordance with ASTM E96/E96M.

6. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F, 180 degree bend on 1 inch mandrel.

7. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.

8. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 200 feet head of water applied in accordance with test method ASTM D5385/D5385M.

9. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.

10. Products:

    a. Carlisle Coatings & Waterproofing Inc; MiraDRI 860/861: www.carlisleccw.com/#sle.

    b. GCP Applied Technologies; Bituthene 4000: www.gcpat.com/#sle.

    c. Soprema; Colphene 3000.

2.03 PMMA-BASED FLASHING

A. Polymethyl methacrylate reinforced flashing system including:

1. PMMA primer(s) suitable for use over concrete footing and column base.

2. Self-Adhesive Modified Bitumen Stripping Ply and Flashing Reinforcing Sheet.

3. PMMA-based flashing resin.

4. Non-woven polyester fleece falshing resin.

B. Manufacturers:

1. Kemper; Kemperol 2k-PUR system.

2. Siplast; ParaPro 123 system.

2.04 ACCESSORIES

A. Attachment Materials:

1. Battens and termination bars: Stainless steel.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Membrane Sealant: As recommended by membrane manufacturer.

D. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.

E. Rigid insulation; see Section 07 21 00 - NTU Thermal Insulation.

F. Protection Board: Provide type capable of preventing damage to waterproofing due to backfilling and construction traffic.

1. Multilayer internally-reinforced asphaltic panels, 1/8 inch thick, nominal, complying with ASTM D6506/D6506M.

G. Cant Strips: Premolded composition material.

H. Flexible Flashings: Type recommended by membrane manufacturer.

I. Surface Conditioner: Compatible with membrane.

J. Adhesives: As recommended by membrane manufacturer.

1. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting work.

B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.

C. Verify that items penetrating surfaces to receive waterproofing are securely installed.

D. Where existing conditions are the responsibility of another installer, notify Architect of unsatisfactory conditions.

E. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect from damage adjacent surfaces not designated to receive waterproofing.

B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.

C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.

D. Fill nonmoving joints and cracks with a filler compatible with waterproofing materials.

E. Seal moving cracks with sealant and nonrigid filler, using procedures recommended by sealant and waterproofing manufacturers.

3.03 INSTALLATION - MEMBRANE

A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

B. Roll out membrane and minimize wrinkles and bubbles.

C. Self-Adhering Membrane: Remove release paper layer and roll out onto substrate with a mechanical roller to provide full contact bond.

D. Overlap edges and ends, minimum 3 inches, seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.

E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.

F. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.

G. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.

H. Extend membrane over cants and up intersecting surfaces at membrane perimeter minimum 6 inches above horizontal surface for first ply and 6 inches at subsequent plies laid in shingle fashion.

I. Seal membrane and flashings to adjoining surfaces.

1. Install termination bar along edges.

2. Install counterflashing over exposed edges.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - NTU Quality Requirements for additional requirements.

B. Owner will provide testing services, and Contractor to provide temporary construction and materials for testing.

3.05 PROTECTION

A. Do not permit traffic over unprotected or uncovered membrane.

3.06 INSTALLATION - PMMA-BASED FLASHING

A. Install PMMA-Based flashing system in full accordance with manufacturer's published preparation and installation methods.

B. Install flashing to cover steel column and post bases. Cure fully prior to placement of pavement system.

C. Extend flashing to cover the column baseplate, fasteners, and top of footing, extending fully around each steel member leaving no exposed metal.

END OF SECTION

SECTION 07 21 00 - THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Batt insulation and vapor retarder in exterior wall, ceiling, and roof construction.

B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

C. Batt insulation for filling interior partitions.

1.02 RELATED REQUIREMENTS

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

B. Section 07 52 00 - NTU Modified Bituminous Membrane Roofing: Installation requirements for board insulation over low slope roof deck.

C. Section 09 21 16 - NTU Gypsum Board Assemblies: Acoustic sealant and acoustic insulation in framed wall and ceiling assemblies.

1.03 REFERENCE STANDARDS

A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

C. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C 2019a.

1.04 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

1.05 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Evaluated Materials Program (EAP); www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.06 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation in Wood Framed Walls: Batt insulation with separate vapor retarder.

B. Insulation in Wood Framed Ceiling Structure: Batt insulation with separate vapor retarder.

C. Insulation in wood framed interior walls for acoustics.

2.02 MINERAL FIBER BLANKET INSULATION MATERIALS

A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.

1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.

2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.

3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.

4. Formaldehyde Content: Zero.

5. Thermal Resistance: R-value of R-13 in interior walls: Owens Corning, "Thermafiber" Fire and Sound Guard Plus. 3.5-inch thickness. Non-faced

6. Thermal Resistance: R-value of R-38 in exterior roof/ceiling cavities where exposed for new work. Owens Corning.

7. Thermal Resistance: R-value of R-21 in exterior wall cavities where exposed for new work. Owens Corning.

8. Products:

    a. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.ocbuildingspec.com/#sle.

b. Or approved equal.

2.03 ACCESSORIES

A. Flashing Tape: Special reinforced film with high performance adhesive.

1. Application: Window and door opening flashing tape.

2. Width: As required for application.

3. Primer: Tape manufacturer's recommended product.

4. Products:

a. Protecto Wrap Company; Protecto Super Stick Building Tape: www.protectowrap.com/#sle.

b. Protecto Wrap Company; Protecto Seal 45 Butyl: www.protectowrap.com/#sle.

c. Protecto Wrap Company; Protecto Seal PW 100/40: www.protectowrap.com/#sle.

d. Protecto Wrap Company; Protecto BT20XL Butyl: www.protectowrap.com/#sle.

e. Protecto Wrap Company; Protecto BT25XL: www.protectowrap.com/#sle.

B. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.

C. Insulation Fasteners: Lengths of unfinished, 13 gauge, 0.072 inch high carbon spring steel with chisel or mitered tips, held in place by tension, length to suit insulation thickness and substrate, capable of securely supporting insulation in place.

D. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

E. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.

F. Wire Mesh: Galvanized steel, hexagonal wire mesh.

G. Protection Board for Below Grade Insulation: Cementitious, 1/4 inch thick.

H. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Install with factory-applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.

F. Staple or nail facing flanges in place at maximum 6 inches on center.

G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

H. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches on center. Lap and seal sheet retarder joints over face of member.

I. Tape seal tears or cuts in vapor retarder.

J. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane; tape seal in place.

3.03 FIELD QUALITY CONTROL

A. See Section One for quality control standards and for additional requirements.

3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 31 13 - ASPHALT SHINGLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphalt shingle roofing.

B. Flexible sheet membranes for eave protection, underlayment, and valley protection.

C. Associated metal flashings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 21 00 - NTU Thermal Insulation: Nailable rigid insulation.

B. Section 07 62 00 - NTU Sheet Metal Flashing and Trim: Edge and cap flashings.

1.03 REFERENCE STANDARDS

A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2021.

B. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules 2019.

C. ASTM D3909/D3909M - Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules 2014.

D. ASTM D7158/D7158M - Standard Test Method for Wind Resistance of Asphalt Shingles (Uplift Force/Uplift Resistance Method) 2020.

E. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings 2020a.

F. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples 2018a.

G. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments 2012, with Editorial Revision (2015).

H. SMACNA (ASMM) - Architectural Sheet Metal Manual 2012.

I. UL (DIR) - Online Certifications Directory Current Edition.

1.04 SUBMITTALS

A. See Section One for submittal procedures.

B. Shop Drawings: For metal flashings, indicate specially configured metal flashings.

C. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern; for color selection.

D. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.

E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1.05 QUALITY ASSURANCE

A. Products are Required to Comply with Fire Resistance Criteria: UL (DIR) listed and labeled.

1.06 FIELD CONDITIONS

1.07 WARRANTY

A. See Section 01 for Closeout Procedures and additional warranty requirements.

B. Correct defective Work within a five-year period after Date of Substantial Completion.

C. Provide five-year manufacturer's warranty for wind damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Asphalt Shingles:

B. Algae Resistant Asphalt Shingles:

1. GAF; Timberline Ultra HD (HDZ) Shingles with StainGuard Plus: www.gaf.com/#sle or approved equal.

2.02 ASPHALT SHINGLES

A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.

1. Fire Resistance: Class A, complying with ASTM E108.

2.03 SHEET MATERIALS

A. Eave Protection Membrane: GAF "StormGuard" leak barrier: synthetic, film-surfaced, peel and stick underlayment, or approved equal.

1. For use at all eaves, rakes, penetrations, and all flashing transitions.

B. Underlayment: Synthetic non-asphaltic sheet, intended by manufacturer for mechanically fastened roofing underlayment without sealed seams.

1. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.

2. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.

3. Fasteners: As recommended by manufacturer or building code qualification report or approval.

4. Manufacturers:

a. GAF "DeckArmor" breathable synthetic underlayment, or approved equal.

C. Starter Strip Shingle:

1. GAF "WeatherBlocker" or approved equal.

2. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.

3. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.

2.04 ACCESSORIES

A. Roofing Nails: Standard round wire shingle type, galvanized steel, stainless steel, aluminum roofing nails, or copper roofing nails, minimum 3/8 inch head diameter, 12 gage, 0.109 inch nail shank diameter, 1-1/2 inch long and complying with ASTM F1667.

B. Plastic Cement: ASTM D4586/D4586M, asphalt roof cement.

C. Lap Cement: Fibrated cutback asphalt type, recommended for use in application of underlayment, free of toxic solvents.

2.05 METAL FLASHINGS

A. Metal Flashings: Provide sheet metal eave edge, gable edge, ridge, ridge vents, open valley flashing, chimney flashing, dormer flashing, and other flashing indicated.

1. Form flashings to profiles indicated on drawings.

2. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

3. Hem exposed edges of flashings minimum 1/4 inch on underside.

4. Coat concealed surfaces of flashings with bituminous paint.

B. Aluminum Sheet Metal: Prefinished aluminum, 26 gage, 0.017 inch minimum thickness; stucco embossed, PVC coating, color as selected.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

B. Verify that roof deck is of sufficient thickness to accept fasteners.

C. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.

D. Verify roof openings are correctly framed.

E. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.02 PREPARATION

A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.

B. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.

C. Broom clean deck surfaces before installing underlayment or eave protection.

D. Install eave edge flashings tight with fascia boards, weather lap joints 2 inches and seal with plastic cement, and secure flange with nails spaced ____ inches on center.

3.03 INSTALLATION - EAVE PROTECTION MEMBRANE

A. Install eave protection membrane from eave edge to minimum 4 ft up-slope beyond interior face of exterior wall.

B. Install eave protection membrane in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

3.04 INSTALLATION - UNDERLAYMENT

A. Underlayment At Roof Slopes Up to 4:12: Install two layers of underlayment over area not protected by eave protection, with ends and edges weather lapped minimum 4 inches, stagger end laps of each consecutive layer, and nail in place.

B. Weather lap and seal watertight with plastic cement any items projecting through or mounted on roof.

3.05 INSTALLATION - METAL FLASHING AND ACCESSORIES

A. Install flashings in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.

3.06 INSTALLATION - SHINGLES

A. Install shingles in accordance with manufacturer's instructions manufacturer's instructions and NRCA (RM) applicable requirements.

1. Fasten strip shingles using four nails per strip, or as required by manufacturer and local building code, whichever is greater.

B. Place shingles in straight coursing pattern with 5-inch weather exposure to produce double thickness over full roof area, and provide double course of shingles at eaves.

C. Extend shingles 1/2 inch beyond face of gable edge fascia boards.

D. Coordinate installation of roof mounted components or work projecting through roof with weather tight placement of counterflashings.

E. Complete installation to provide weather tight service.

3.07 PROTECTION

A. Do not permit traffic over finished roof surface.

END OF SECTION

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SECTION 07 52 16
SBS MODIFIED BITUMINOUS MEMBRANE ROOFING, FLUID-APPLIED

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Styrene-butadience-styrene (SBS) modified bituminous membrane roofing system on a plywood deck with a layer of 1”-thick insulation in areas of new work, including but not limited to:
   2. a. Roof insulation.
      b. Roof membrane system consisting of base sheet, modified bitumen cap and membrane base flashings.
      c. Roof surfacing consisting of mineral granulated cap sheet with field applied coating compliant with Title 24/CRRC.
      d. Flashings for all penetrations, projections, and pipes.
      e. New gutters, downspouts and all metal terminations where occur.
      f. Walkway Pads

B. Related Sections:
   1. Section 01 73 29 – Cutting and Patching.
   2. Section 07 62 00 - Sheet Metal Flashing and Trim
   3. Section 07 72 00 – Roof Accessories
   4. Section 07 92 00 – Joint Sealants

1.03 DEFINITIONS

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. ENDURE BIO: Is a two [2] part urethane, 100 % solids, bio based, asbestos free, cold process membrane interply adhesive. Is a certified BIO based material approved by USDA. Approved to be used in MB and BUR systems.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck, orientation of membrane roofing, and fastening spacing’s and patterns for mechanically fastened components.
   1. Base flashings and built-up terminations.
   2. Indicate details meet requirements of NRCA and FMG required by this Section.
   3. Tapered or un-tapered insulation, including slopes.
   4. Crickets, saddles, and tapered edge strips, including slopes.
   5. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Samples for Verification: For the following products:
   1. Sheet roofing materials, of color specified for exposed material.
   2. Roof substrate board and insulation.

1.05 INFORMATIONAL SUBMITTALS

A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

B. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.
   1. Include letter from Manufacturer written for this Project indicating approval of Installer.

C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
   1. Submit evidence of compliance with performance requirements, including UL listing certificate.
   2. Indicate that proposed system components are compatible.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.

E. Warranties: Unexecuted sample copies of special warranties.

F. Field Quality Control Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.

1.06 CLOSEOUT SUBMITTALS

A. Maintenance Data: To include in maintenance manuals.

B. Warranties: Executed copies of warranties.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

B. Manufacturer Qualifications: Approved manufacturer with UL Class A listed roofing systems comparable to those specified for this Project, with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.
   1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
      a. Product data, including certified independent test data indicating compliance with requirements.
      b. Samples of each component.
      c. Sample submittal from similar project.
      d. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.
      e. Sample warranty.
   2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements. Only prime contractor will be allowed to submit request for substitution.
   3. Approved manufacturers must meet separate requirements of Submittals Article.
   4. Wind uplift requirement: Provide information to support system to be installed meets or exceed wind uplift criteria set forth and is based upon system to be installed.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
   1. An authorized full-time technical employee of the manufacturer.
   2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.

D. Preinstallation Roofing Conference: Conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, 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 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 flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
   7. Review governing regulations and requirements for insurance and certificates if applicable.
   8. Review temporary protection requirements for roofing system during and after installation.
   9. Review roof observation and repair procedures after roofing installation.

1.08 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.

1.09 PROJECT 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.

B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
3. Remove temporary plugs from roof drains at end of each day.
4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

A. Warranty, General: Warranties specified 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.

B. Manufacturer's Warranty: Manufacturer's standard or customized form, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
1. Manufacturer's warranty includes roofing membrane, base flashings, fasteners, roofing membrane accessories and other components of roofing system specified in this Section.
2. Warranty Period: 20 years from date of Substantial Completion.

C. Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, and walkway products, for the following warranty period:
1. Warranty Period: Five years from date of Substantial Completion.

D. Manufacturer Inspection and Preventive Maintenance Requirement: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's annual inspections and preventive maintenance is included in the Contract Sum.
1. Inspections to occur in the following years subsequent to completion: 2, 5, 10 and 15 completing: Follow up inspections with reports to owner, preventative maintenance and housekeeping.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Manufacturer/Product: The roof system specified in this Section is based upon products of Tremco, Inc., www.tremcoroofing.com for basis of design, named in other Part 2 articles. Subject to compliance with requirements, provide the named product or an approved comparable product by one of the following:
1. System meeting system performance criteria
2. Warranty coverage and length
3. Cool roof rating in most current CRRC manual
4. Approved by the Owner and Architect deemed to be equal based on criteria defined.

B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

C. Or Approved Equal

2.02 PERFORMANCE REQUIREMENTS

A. General Performance: Roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.
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.

2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. Flashings and Fastening: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
   1. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
   2. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.
   3. Copper Development Association, Inc

D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

E. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

F. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

G. Energy Performance: Roofing system shall have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.

H. FM Global Compliance: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4470 as part of a roofing system and shall be listed in FM Global's "RoofNav" or shall receive written FM Global project approval for Class 1 or non-combustible construction, as applicable. Identify applicable materials with FM Global markings.
   1. Fire/Windstorm Classification: Class 1A-75

I. Flashings: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Manufactured Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials that comply with requirements and recommendations of the following:
   1. FMG 1-49 Loss Prevention Data Sheet for Perimeter Flashings.
   2. FMG 1-29 Loss Prevention Data Sheet for Above Deck Roof Components.
   3. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
   4. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details

2.03 ROOFING MEMBRANE MATERIALS

A. Sheathing Paper: Red rosin type, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

B. Base Sheet:
   1. ASTM D 6163 Type III Grade S heavy-duty base sheet
      a. Basis of design product: Tremco, Powerply Heavy Duty Base or equal
      b. Tear strength, ASTM D 5147 220 lbf/in/MD and 240 lbf/in XMD
      c. Tensile Strength, ASTM 5147 220 lbf/inMD and 190 lbf/in XMD
      d. Thickness: 3.0 mm

C. SBS Modified Bituminous Cap Sheet:
      a. **Roof finishing sheet:** ASTM D 6164 Type I Grade G SBS-modified asphalt-coated glass-fiber-reinforced sheet, granular surfaced with a factory applied white reflective granule.
      b. Basis of design product: Tremco, POWERply Endure 200 FR, or equal

c. Exterior Fire-Test Exposure, ASTM E 108: Class A.
d. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction 165 lbf/in (12.0 kN/m); Cross machine direction 140 lbf/in (8.8 kN/m).
e. Tear Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction, 160 lbf (400 N); Cross machine direction 110 lbf (400 N).
f. Elongation at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction 55 percent; Cross machine direction 60 percent.
g. Low Temperature Flex, maximum, ASTM D 5147: -10 deg. F (-23 deg. C).
h. Thickness, minimum, ASTM D 5147: 0.157 inch (3.8 mm).
i. Solar Reflectance Index (SRI), ASTM E 1980: 88. D. Base Flashing Backer Sheet:

1. ASTM D 6163 Type III Grade S heavy-duty base sheet
   a. Basis of design product: Tremco, Powerply Heavy Duty Base or equal
   b. Tear strength, ASTM D 5147 220 lbf/in/MD and 240 lbf/in XMD
   c. Tensile Strength, ASTM 5147 220 lbf/inMD and 190 lbf/in XMD
   d. Thickness: 3.0 mm

E. Base Flashing Sheet: for walls and curbs
   a. ASTM D 6163 Type I Grade G SBS-modified asphalt-coated glass-fiber-reinforced sheet, granular surfaced with a factory applied white reflective granule; CRRC listed and California Title 24 Energy Code compliant.
   b. Basis of design product: Tremco, POWERply Standard FR GT24W, or equal
   c. Exterior Fire-Test Exposure, ASTM E 108: Class A.
   d. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction 70 lbf/in (12.0 kN/m); Cross machine direction 50 lbf/in (8.8 kN/m).
   e. Tear Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction, 90 lbf (400 N); Cross machine direction 90 lbf (400 N).
   f. Elongation at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction 4 percent; Cross machine direction 4 percent.
   g. Low Temperature Flex, maximum, ASTM D 5147: -10 deg. F (-23 deg. C).
   h. Thickness, minimum, ASTM D 5147: 0.157 inch (4 mm).
   i. Solar Reflectance Index (SRI), ASTM E 1980: 88.

F. Glass-Fiber Fabric: Woven glass-fiber cloth treated with asphalt, ASTM D 1668 Type I.

2.04 FLUID-APPLIED MATERIALS

A. BIO Adhesive

1. Basis of design product: Tremco, BIO ENDURE ADHESIVE, or equal
2. Bio base content: ASTM D6866 71%
3. Density ASTM D1475 11.1lbs./gal
4. Volume solids ASTM D2697 100%
5. Weight solids ASTM D1644 100%

B. Asphalt primer, water-based, polymer modified.
   1. Basis of design product: Tremco, TREMprime WB.
   2. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 2 g/L.

C. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

2.05 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
   1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Cold-Applied Adhesive:
   1. Roof Cement, Asphalt-Based: ASTM D 4586, Type II, Class I, fibrated roof cement formulated for use in installation and repair of asphalt ply and modified bitumen roofing plies and flashings; UL-classified for fire resistance. a. Basis of design product: Tremco, ELS.
      b. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 190 g/L.
      c. Non-Volatile Matter, ASTM D 4586: 85 percent.

C. Joint Sealant: Elastomeric joint sealant compatible with roofing materials, with movement capability appropriate for application.
   1. Joint Sealant, Polyurethane: ASTM C 920, Type S, Grade NS, Class 25 single-component moisture curing sealant, formulated for compatibility and use in dynamic and static joints.
      a. Basis of design product: Tremo, Proseal.
      b. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 85 g/L.
      c. Hardness, Shore A, ASTM C 661: 40.
      d. Color: White.

D. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion resistance provisions in FM Global 4470, designed for fastening roofing components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

E. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

F. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

G. Fluid applied membrane: Fluid applied reinforced membrane for pipes, penetrations and projections: Two [2] part Bio based fluid applied membrane by roof systems manufacture.

2.06 ROOF INSULATION/SUBSTRATE BOARD

A. Roof Insulation, General: Preformed roof insulation/substrate boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated on drawings and details: R-10 value.
   1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes at backside of curbs.
   2. Tapered insulations: ASTM C1289 Polyisocyanurate tapered system at roof edges where gutters occur.
   3. Maintain minimum insulation depth as required to achieve an R-5 insulation value at edges of conditioned space.

B. Roof Insulation Cover Board: Dens Deck: ASTM C 1177 ½ inch primed Dens Deck

C. Cant Strips: ASTM C 208, Type II, Grade I, cellulosic -fiber.

D. Insulation cant strips: ASTM C 208, Type II, Grade I, cellulosic-fiber insulation board.

E. Substrate Joint Tape: Minimum 6 inch (150 mm) wide, coated, glass-fiber joint tape F.

Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

2.07 SURFACING MATERIALS

A. Acrylic Roof Coating, Fire-Retardant Elastomeric: Intumescent and solar reflectant, Energy Star qualified, CRRC listed, and California Title 24 Energy Code compliant, formulated for use on bituminous roof surfaces. Tinted to match existing roof color.
   1. Basis of design product: Tremco, Polarcote FR or equal
   2. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: Not more than 30 g/L.
   3. Reflectance, minimum, ASTM C 1549: 82 percent.
   4. 4. Solar Reflectance Index (SRI), ASTM E 1980: 103.

2.08 WALKWAYS

A. Walkway pads, ceramic-granule-surfaced reinforced asphaltic composition slip-resisting pads, manufactured as a traffic pad for foot traffic, 1/2-inch (13 mm) thick minimum.
   1. Basis of design product: Tremco, Trem-Tred, or equal.
   2. Flexural Strength at max. load, minimum, ASTM C 203: 210 psi (1.5 kPa).
   3. Granule adhesion (weight loss), maximum, ASTM D 4977: 1.1 gram.
   4. Impact Resistance at 77 deg. F (25 deg. C), ASTM D 3746: No Damage to Roof.
   5. Pad Size: 36 by 48 inch (914 by 1220 mm).
   6. Provide shop drawing indicating walkway pad layout for access to roof-top equipment from lines “5” and “C” to existing roof top equipment.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
   1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
   2. Concrete Roof Deck: Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed, with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
   3. Verify that concrete substrate is visibly dry, free of moisture, and slopes to drain.
   4. Verify that cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation. B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 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.

C. Spud off all existing aggregate from membrane. Do not damage membrane.

D. Install sloped insulation where needed to provide cricketing and maintain positive drainage to existing roof drains and scuppers.

3.03 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer's recommendations.

B. Install roofing system in accordance with the following NRCA Manual Plates and NRCA recommendations, as applicable; modify as required to comply with requirements of FM Global references above and specific project details for gutters, canopy edges, and others as detailed:
   1. Metal Parapet Cap (Coping) and Base Flashing: Plates MB-1 and MB-1S.
   2. Base Flashing for Wall-supported Deck: Plates MB-5 and MB-5S.
   3. Base Flashing for Non-wall-supported deck (Movement Joint): Plates MB-6 and MB-6S.
   4. Base and Surface-mounted Counterflashing: Plates MB-4 and MB-4S..
   5. Raised Perimeter Edge with Metal Flashing (Fascia Cap): Plates MB-2 and MB-2S.
   6. Embedded Edge Metal Flashing Edge (Gravel-stop): Plates MB-3 and MB-3S.
   7. Gutter at Draining Edge: Plates MB-22 and MB-22S.
   8. Equipment Support Curb: Plates MB-9 and MB-9S.

9. Raised Curb Detail at Rooftop HVAC Units (Job site constructed wood curb): Plates MB-13 and MB-13S and Division 06 Section "Miscellaneous Rough Carpentry."
10. Penetration, Sheet Metal Enclosure for Piping Through Roof Deck: Plates MB-16 and MB16S
11. Penetration, Isolated Stack Flashing: Plates MB-17 and MB-17S.
12. Penetration, Plumbing Vent: Plates MB-18 and MB-18S.
13. Penetration, Pocket: Plates MB-19 and MB-19S.
14. Roof Drain: Plates MB-20 and MB-20S.
15. Guide for Clearances between Pipes / Walls / Curbs - Table 4
16. Guide for Crickets and Saddles - Table 5

3.04 SUBSTRATE BOARD /INSULATION INSTALLATION

A. Comply with built-up roofing manufacturer's written instructions for installing roof insulation.

B. Cant Strips: Install and secure preformed 45-degree cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.

C. Install insulation/ substrate board with long joints of board in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
   1. Cut and fit substrate board/insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

D. Trim surface of substrate board/ insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

E. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

F. Mechanically Fastened Substrate board/Insulation: Install layer of substrate board/insulation to deck using mechanical fasteners specifically designed and sized for fastening specified boardtype roof insulation to deck type.
   1. Fasten layer of substrate board/insulation according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification, meet I-75
   2. Set cants and tapered edge in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg. F (14 deg. C) of equiviscuous temperature.

3.05 FLUID-APPLIED ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:

   1. Deck Type: Concrete.

   2. Base Sheet: One.

      a. Adhering Method: Fluid applied.

   3. Granular-Surfaced SBS-Modified Asphalt Cap Sheet:

      a. Adhering Method: Fluid applied.

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing agencies engaged or required to perform services for installing roofing system.

D. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work configured as recommended by NRCA Roofing Manual Appendix: Quality Control Guidelines - Insulation to protect new [and existing] roofing.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
3. Remove temporary plugs from roof drains at end of each day.

4. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Fluid applied mixing: Mix Part A [base] for 1 minute before adding Part B [curative]. After adding part B, mix the combined materials for a minimum of two [2] minutes. Make sure to mix areas around the side walls and bottom of pail.

1. Apply fluid applied adhesive at the rate of two [2] gallons per 100 square feet, interply.

F. Substrate-Joint Penetrations: Prevent adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.06 BASE-SHEET INSTALLATION

A. Loosely lay one course of rosin sheet, lapping edges and ends a minimum of 2 inches and 6 inches. Scatter nail into place with square head nails driven flush.

B. Install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:
1. Adhere to insulation in a solid application of fluid applied adhesive @ the rate of two [2] gallons per 100 square feet.
2. Press base sheet into adhesive with weighted roller.

3.07 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane [basesheet] cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer. Back nail as required for slope.
2. Adhere to base sheet in a continuous application of fluid applied adhesive at the rate of two [2] gallons per 100 square feet.
3. Press membrane into adhesive using a weighted roll. Side laps 4 inches and end laps 6 inches. Heat weld all laps

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Install roofing membrane sheets so side and end laps shed water. Completely bond and seal laps, leaving no voids.
1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Heat weld all laps.

3.08 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions, and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Backer Sheet Application: Install backer sheet and adhere to substrate in a continuous application of fluid applied adhesive.
3. Flashing Sheet Application: Adhere flashing sheet to substrate in a continuous application of fluid applied adhesive at the rate of two [2] gallons per 100 square feet.

B. Extend base flashing up walls or parapets a minimum of 12 inches (300 mm) above built-up roofing and 6 inches (150 mm) onto field of roof membrane.

C. Flashing Sheet Top Termination: Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
1. Seal top termination of base flashing with a metal termination bar and joint sealant.

D. Flashing Sheet Bottom Termination: Adhere flashing sheet to roof membrane sheet continuously along bottom of flashing sheet.

E. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.

F. Pipes/penetrations/projections: Clean prime and coat all pipes/penetrations and projections with AG Bio base @ the rate of two [2] gallons per 100 square feet. While base is wet, embed Perma fab reinforcement around projection, allow to cure and top coat with AG top coat @ the rate of one [1] gallon per 100 square feet. Extend onto the field of the roof and square off neatly.

G. Gravelstop: After installation of new cool roof cap, furnish and install a bead of ICE coating at the intersection of the [n] cool roof cap and gravelstop rise. Cover adhesive completely.

H. Baseflashing @ corners: Apply BIO to all corners from field sheet up to counterflashing.

3.09 SURFACING AND COATING INSTALLATION

A. Over a clean and dry membrane, apply Cool Roof coating over entire roof and base-flashings in an even and continuous manner. Apply coating in two [2] equal applications per manufactures required. Note if roof is left without being coated for over 30 calendar days, consult with manufacturer and Architect. At minimum roof shall be washed free of all accumulated dirt and debris. If the roof is left for an extended period of time, the roof will need to be primed at the rate ½ gallon per 100 square feet.

B. B. Apply Coating as required to touch up roof membrane, paint vent pipes, conduits and miscellaneous projections.

3.10 WALKWAY INSTALLATION

A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
1. Set walkway pads in cold-applied adhesive.
2. Install walkway pad path from Owner's roof access point (line D) to all new equipment.

3.11 FIELD QUALITY CONTROL

A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.

B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 6 fulltime days on site to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation at commencement and upon completion.

1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

D. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.

1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.12 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

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.

3.13 3.14 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner:
2. Address:
3. Building Name/Type:
4. Address:
5. Area of Work:
6. Acceptance Date:
7. Warranty Period:
8. Expiration Date:

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition. D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by: a. lightning;
   b. peak gust wind speed exceeding 74 mph (33 m/s);
   c. fire;
   d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
   e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
   f. vapor condensation on bottom of roofing; and
   g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor. E. IN WITNESS THEREOF, this instrument has been duly executed by:

1. Authorized Signature:
2. Name:
3. Date:

END OF SECTION 07 52 16

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counter-flashings, gutters, downspouts, sheet metal roofing, and exterior penetrations.

B. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS

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

B. Section 07 52 00 - NTU Modified Bituminous Membrane Roofing.

C. Section 07 92 00 - NTU Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

D. Section 09 90 00 - NTU Painting and Coating: Field painting.

1.03 REFERENCE STANDARDS

A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2021.

B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2021, with Errata (2022).

C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2020, with Errata (2022).

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

E. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2021a.

F. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

G. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2021.

H. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing 2015a (Reapproved 2021).

I. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free 2007 (Reapproved 2018).

J. CDA A4050 - Copper in Architecture - Handbook current edition.

K. SMACNA (ASMM) - Architectural Sheet Metal Manual 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.

3. Refer to Section 01 81 13 - NTU Sustainable Design Requirements: Requirements for low-emitting materials.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 10 years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) thick base metal.

B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch thick base metal, shop pre-coated with PVDF coating.

1. Silicone Modified Polyester Coating: Pigmented organic powder coating, AAMA 2603; baked enamel finish system.

2. Polyvinylidene Fluoride (PVDF) Coating: Superior performing organic powder coating, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

3. Color: to match existing building colors and otherwise as indicated on drawings.

C. Pre-Finished Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 18-gauge, 0.040 inch thick; plain finish shop pre-coated with silicone modified polyester coating.

1. Fluoropolymer Coating: High performance organic powder coating, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.

2. Color: to match existing building colors.

2.02 FLASHING UNDERLAYMENT

A. Sheet Membrane Underlayment at Flashings: Self-adhered, cold-applied composite rubberized asphalt sheet membrane consisting of rubberized asphalt bonded to a cross-laminated high-density polyethylene film with primers and seam sealers as required for a complete watertight installation; provide materials compliant with applicable regulations limiting VOCs.

1. Under Sheet Metal and Flashing: Minimum 40-mil thick, high temperature self-adhering, polymer-modified, bituminous sheet membrane, complying with ASTM D1970/D1970M, manufacturers and types as follows:

a. Basis-of-Design Product: The design for the system is based on the manufacturer identified below. Subject to compliance with requirements, provide the named product or a comparable product by the following:

b. Basis-of-Design Product: GCP Applied Technologies; Grace Ice and Water Shield HT.

c. Ensure named product is compatible with fluid-applied membrane air barrier material for a complete weathertight system.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Match existing flashing profiles, unless noted otherwise.

C. Fabricate cleats of same material as sheet, minimum 6 inches wide, interlocking with sheet.

D. Form pieces in longest possible lengths.

E. Hem exposed edges on underside 1/2 inch; miter and seam corners.

F. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

G. Tin edges of copper sheet to be soldered; solder shop formed metal joints, and after soldering, remove flux, wipe and wash solder joints clean; provide weathertight joints.

H. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.

I. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.04 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: Profile as indicated.

B. Downspouts: Profile as indicated.

C. Gutters and Downspouts: Size indicated.

D. Accessories: Profiled to suit gutters and downspouts.

1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.

2. Gutter Supports: Brackets.

3. Downspout Supports: Brackets.

E. Downspout Boots: Steel.

F. Downspout Extenders: Same material and finish as downspouts.

G. Seal metal joints.

2.05 EXTERIOR PENETRATION FLASHING PANELS

A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

2.06 ACCESSORIES

A. Fasteners: Stainless steel, with soft neoprene washers.

B. Underlayment: ASTM D2178/D2178M, glass fiber roofing felt.

C. Slip Sheet: Rosin sized building paper.

D. Primer: Zinc chromate type.

E. Concealed Sealants: Non-curing butyl sealant.

F. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

1. Products:

a. Franklin International, Inc; Titebond WeatherMaster Metal Roof Sealant: www.titebond.com/#sle.

G. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.

H. Reglets: Surface-mounted type, galvanized steel; face and ends covered with plastic tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

3.03 UNDERLAYMENT

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

3.04 INSTALLATION

A. Comply with drawing details.

B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Seal metal joints watertight.

F. Secure gutters and downspouts in place with concealed fasteners.

G. Connect downspouts to downspout boots, and grout connection watertight.

3.05 FIELD QUALITY CONTROL

A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

SECTION 07 71 00 - ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured roof specialties, including copings, fascias, gravel stops, and vents.

1.02 RELATED REQUIREMENTS

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

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof copings, fascias, and drainage trim.

C. Section 07 92 00 - Joint Sealants.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.

B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2021, with Errata (2022).

C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2020, with Errata (2022).

D. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems 2017.

E. NRCA (RM) - The NRCA Roofing Manual 2022.

1.04 SUBMITTALS

A. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

B. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

C. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Roof Edge Flashings, Counter-flashings and Copings:

1. Custom, shop fabricated to match existing profiles and configurations.

2.02 COMPONENTS

A. Roof Edge Flashings: Custom, shop fabricated to sizes required; corners mitered and mitered; concealed fasteners.

1. Configuration: Fascia, cant, and edge securement for roof membrane.

2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.

3. Exposed Face Height: As indicated on drawings.

4. Material: Formed aluminum sheet, 0.050 inch thick, minimum.

5. Material: Extruded aluminum, 0.08 inch thick, minimum.

6. Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch thick, minimum.

7. Finish: 70 percent polyvinylidene fluoride.

8. Color: As indicated on drawings. To match existing building color.

B. Copings: Custom shop-fabricated to sizes required; corners mitered and mitered; concealed fasteners.

1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness, and finish as cap; concealed stainless steel fasteners.

2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.

3. Wall Width: As indicated on drawings.

4. Outside Face Height: As indicated on drawings.

5. Inside Face Height: As indicated on drawings.

6. Material: Formed aluminum sheet, 0.040 inch thick, minimum.

7. Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch thick, minimum.

8. Finish: 70 percent polyvinylidene fluoride.

9. Finish: Anodized natural (clear).

10. Color: As indicated on drawings.

C. Roof Penetration Sealing Systems: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for

conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.

1. Products:

    a. Menzies Metal Products; Electrical Roof Stack and Cap: www.menzies-metal.com/#sle.

D. Counterflashings: Factory fabricated and finished sheet metal that overlaps top edges of base flashing by at least 4 inches, and designed to snap into through-wall flashing or reglets with lapped joints.

2.03 FINISHES

A. Clear Anodized Finish: AAMA 611 AA-M12C22A41 Class I clear anodic coating not less than 0.7 mil, 0.0007 inch thick.

B. Color Anodized Finish: AAMA 611 AA-M12C22A42/44 Class I integrally or electrolytically colored anodic coating not less than 0.7 mil, 0.0007 inch thick.

C. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system; color as indicated.

D. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as indicated.

2.04 ACCESSORIES

A. Sealant for Joints in Linear Components: As recommended by component manufacturer.

B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Seal joints within components when required by component manufacturer.

C. Anchor components securely.

D. Coordinate installation of components of this section with installation of roofing membrane and base flashings.

E. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

D. Field quality control

1.02 RELATED REQUIREMENTS

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

B. Section 01 for Sustainable Design and material requirements and additional requirements for sealants and primers. Requirements for low-emitting materials.

C. Section 08 11 13 - NTU Hollow Metal Doors and Frames.

D. Section 08 71 00 - NTU Door Hardware: Setting exterior door thresholds in sealant.

E. Section 09 21 16 - NTU Gypsum Board Assemblies: Acoustical insulation in sound-rated walls and ceilings.

F. Section 09 30 00 - NTU Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015 (Reapproved 2022).

B. ASTM C834 - Standard Specification for Latex Sealants 2017.

C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2022.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2018.

G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants 2018.

H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints 2019 (Reapproved 2020).

I. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension 2016 (Reapproved 2021).

J. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

K. SCAQMD 1168 - Adhesive and Sealant Applications 1989, with Amendment (2017).

1.04 ACTION SUBMITTALS

A. CALGreen Submittals: Provide product data to demonstrate that adhesives, sealants, and caulks,including all system components such as primers, adhesives, and coatings meet the requirements of the following standards:

1. TABLE 5.504.4.1 - ADHESIVE VOC LIMIT; TABLE 5.504.4.2 - SEALANT VOC LIMIT as listed in Section 01 81 13 - NTU Sustainable Design Requirements.

B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.

2. List of backing materials approved for use with the specific product.

3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.

4. Substrates the product should not be used on.

5. Substrates for which use of primer is required.

6. Substrates for which laboratory adhesion and/or compatibility testing is required.

7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.

8. Sample product warranty.

9. Certification by manufacturer indicating that product complies with specification requirements.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Drawings or catalog illustrations in sufficient detail to show installation and interface of the work of this Section with the work of adjacent trades.

E. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

1.05 INFORMATIONAL SUBMITTALS

A. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds (VOCs).

B. Submit manufacturer’s letter of certification that products comply with specified requirements and are suitable for the uses intended.

C. Product Test Reports:

1. Certified test results of elastomeric sealants showing compliance with specified requirements. Include results of aged performances including hardness, stain-resistance, adhesion and cohesion under cyclic movement, low temperature flexibility, modulus of elasticity at 100-percent strain, effects of heat and aging, and effects of accelerated weathering.

2. Preconstruction field test results indicating which products and joint preparation methods demonstrated acceptable adhesion to joint substrates.

D. Installer Qualifications:

1. Written documentation of applicator's qualifications, including reference projects of similar scope and complexity, with current phone contacts of architects and owners for verification.

1.06 CLOSEOUT SUBMITTALS

A. Sustainable Design Documentation: For sealants and primers, submit VOC content and emissions documentation; see Section 01 for Sustainable Design Requirements.

B. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.

C. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

D. Field Quality Control Log: Submit filled-out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

E. Manufacturer's qualification statement.

F. Installer's qualification statement.

1.07 QUALITY ASSURANCE

A. Single Source Responsibility for Joint Sealants: Obtain joint sealants of each type from a single manufacturer.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company shall be approved by the sealant manufacturer and shall demonstrate at least three years of documented experience in installing materials of types specified.

1. Provide list of at least three projects of similar scope and complexity.

2. Installer shall designate a single individual as project foreman who shall be on site at all times during installation.

D. Pre-Installation Conference: Prior to scheduled commencement of the sealant installation and associated work, conduct a meeting at the project site with the installer, architect/consultant, owner, manufacturer’s representative and any other persons directly involved with the performance of the Work. The Installer shall record conference discussions and to include decisions and agreements reached (or disagreements) and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to the Work.

E. Preinstallation Field Adhesion Test Plan: For jobsite field samples prior to general installation, conduct field-tests for adhesion of each type of joint sealant and joint substrates using proposed joint preparation methods recommended by manufacturer.,

1. Include destructive field adhesion testing of one sample of each combination of sealant type and substrate.

2. Field Adhesion Test Method: Use manufacturer's standard field adhesion test methods and methods proposed for joint preparation to verify proper priming and joint preparation techniques required to obtain optimum adhesion of joint sealants to joint substrate. Evaluate and report results of field adhesion testing.

3. Propose locations for field-test joints where inconspicuous and obtain Architect's approval prior to proceeding.

4. Field Samples: Joints installed during pre-construction field adhesion testing that are accepted by Architect shall be retained as standard of acceptability and incorporated into Work of that area during general installation. At least one such standard of minimum 5 feet in length shall be established for each type of sealant and substrate.

5. Destructive testing is not required for interior acrylic latex sealants.

F. Nondestructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.

1. Record results on Field Quality Control Log.

2. Repair failed portions of joints.

G. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.

1. Sample: At least 18 inches long.

2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the 1-inch mark is that distance from the substrate, the test has failed.

3. If either adhesive or cohesive failure occurs before minimum elongation, take necessary measures to correct conditions and retest; record each modification to products or installation procedures.

4. Record results on Field Quality Control Log.

5. Repair failed portions of joints.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job site in the manufacturer's unopened containers with all labels intactand legible at time of use. Handle and store materials in accordance with manufacturer's recommendations with proper precautions to ensure fitness of material when installed.

1.09 WARRANTY

A. Manufacturer Warranty: Provide a 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

B. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

--------ADDITIONAL WARRANTY REQUIREMENTS - edit to suit ----------

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

D. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

E. Exterior Sealants: Furnish a written warranty against leaks or other defects of materials and workmanship. Defects include but are not limited to changes in the structural, physical, or chemical properties of the sealant materials that impair function or require abnormal maintenance, changes in surface finish, color or texture, failure in adhesion, weather resistance or durability, failure to prevent entry of water, or failure to comply with specified requirements.

1. This warranty shall not cover formation of cracks or defects in substrate materials adjacent to the seal, joint movement in excess of movement rating of sealant, or physical damage caused by others.

2. Repair or replace defective materials and workmanship during warranty period without expense to Owner, including removal and replacement of other items as required.

3. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

4. Warranty Period: Ten years from date of Substantial Completion.

F. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.

2. Disintegration of joint substrates from natural causes exceeding design specifications.

3. Mechanical damage caused by individuals, tools, or other outside agents.

4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 PRODUCTS

2.01 SUSTAINABLE MATERIAL REQUIREMENTS, GENERAL

A. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene, and trichloroethylene), except for aerosol products as specified in subsection 2, below.

B. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to:

a. Wall expansion and control joints.

b. Joints between door, window, and other frames and adjacent construction.

c. Joints between different exposed materials.

d. Openings below ledge angles in masonry.

e. Other joints indicated below.

2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.

a. Joints between door, window, and other frames and adjacent construction.

b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.

c. Other joints indicated below.

3. Do not seal the following types of joints:

a. Intentional weep holes in masonry.

b. Joints indicated to be treated with manufactured expansion joint cover, or some other type of sealing device.

c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.

d. Joints where installation of sealant is specified in another section.

e. Joints between suspended panel ceilings/grid and walls.

2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 for Sustainable Design Requirements.

B. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.04 ELASTOMERIC JOINT SEALANTS

A. Sealant Type A: Low-modulus, non-sag sealant; comply with ASTM C920, Type S or M, Grade NS, Class 25, Class 35, Class +50/-50, Class +100/-50 as applicable.

1. Applications: For **exterior** joints in **vertical surfaces and non-traffic horizontal surfaces** including, but not limited to, the following:

a. Control and expansion joints in cast-in-place concrete.

b. Joints between architectural pre-cast concrete units.

c. Control and expansion joints in unit masonry.

d. Butt joints between metal panels.

e. Joints between marble and granite.

f. Joints between different materials listed above.

g. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers, and similar openings.

h. Control and expansion joints in ceiling and overhead surfaces.

2. Single-Component Urethanes and Silyl-Terminated Polymers:

a. Sikaflex-1a (13)

b. Sikaflex Textured Sealant (40)

c. Sikaflex-15 LM (33)

d. SikaHyflex 150 LM (18)

3. Multiple-Component Urethanes and Silyl-Terminated Polymers:

a. Sikaflex-2c NS EZ mix (63)

4. Single-Component Silicones:

a. Sikasil WS 290 (29)

b. Sikasil WS 295 (37)

c. Sika Silbridge 300 (?)

d. Sikasil 728NS (21)

e. Sikasil N Plus (37)

B. Sealant Type B: Low-modulus, non-sag sealant; comply with ASTM C920, Type S or M, Grade NS, Class 25, Class 35, Class +50/-50, Class +100/-50 as applicable.

1. Applications: For **interior** joints in **vertical surfaces and non-traffic horizontal surfaces** including, but not limited to, the following:

a. Control and expansion joints on exposed interior surfaces of exterior walls.

b. Perimeter joints on exposed interior surfaces of exterior openings.

c. Joints on pre-cast beams and planks.

d. Perimeter joints between interior wall surfaces and frames of interior doors, windows, storefronts, louvers, elevator entrances and similar openings.

e. Trim or finish joints subject to movement.

2. Single-Component Urethanes and Silyl-Terminated Polymers:

a. Sikaflex-1a (13)

b. Sikaflex Textured Sealant (40)

c. Sikaflex-15 LM (33)

d. SikaHyflex 150LM (18)

3. Multiple-Component Urethanes and Silyl-Terminated Polymers:

a. Sikaflex-2c NS EZ mix (63)

4. Single-Component Silicones:

a. Sikasil WS-290 (29)

b. Sikasil WS-295 (37)

c. Sika Silbridge 300 (?)

C. Sealant Type C: Polyurethane complying with ASTM C920, Type S or M, Grade P, Class 25 or silicone sealant complying with ASTM C920,Type S or M, Grade P or NS, Class 100/50 as applicable.

1. Applications: For **exterior and interior** joints in **horizontal and sloped traffic surfaces** including, but not limited to, the following:

a. Control expansion and isolation joints in cast-in-place concrete.

b. Control expansion and isolation joints in structural pre-cast concrete units.

c. Joints between architectural pre-cast concrete paving units.

d. Tile control and expansion joints.

e. Joints between different materials listed above.

2. Single Component Urethane.

a. Sikaflex-1c SL (40)

3. Multiple-Component Urethane.

a. Sikaflex-2c SL (38)

4. Single Component Silicone:

a. Sikasil 728 SL (29)

5. Multiple-Component Silicone:

a. Sikasil 728 RCS (30)

D. Sealant Type D: Single-component or multi-component polyurethane sealant certified by National Sanitation Foundation as conforming to the requirements of NSF Standard 61-Drinking Water System Components-Health Effects; comply with ASTM C920, Type S or M, Grade P or NS, Class 25; select color from the NSF listing.

1. Applications: For **exterior and interior** joints in vertical and horizontal surfaces of **potable water storage areas.**

2. Single Component Urethane:

a. Sikaflex-1a (13)

3. Multiple-Component Urethane:

a. Sikaflex-2c NS EZ mix (63)

E. Sealant Type E: Single-component or multi-component polyurethane sealant complying United States Department of Agriculture (USDA) guidelines for incidental food contact with the cured sealant; comply with ASTM C920, Type S or M, Grade P or NS, Class 25; select color from listing of those approved.

1. Applications: For **interior joints** in **vertical and horizontal surfaces where incidental food contact** may occur.

2. Single Component Urethane:

a. Sikaflex-1a (13)

3. Multiple-Component Urethane:

a. Sikaflex-2c NS EZ Mix (63)

F. Sealant Type F: Single-component urethanes and silyl-terminated polymers.

1. Applications: For interior or exterior joints in vertical surfaces between laps in fabrications of sheet metal.

2. Single Component Urethane; Sikaflex-1a, Sikaflex Textured Sealant, SikaHyflex 150LM.

a. Sikaflex-1a (13)

b. Sikaflex Textured Sealant (63)

c. SikaHyflex 150LM (18)

G. Sealant Type G: Single-component urethanes and silicones.

1. Applications: For **exterior vertical joints under metal thresholds and saddles or as bedding sealant for sheet metal flashing and frames of metal or wood.**

2. Single Component Urethane:

    a. Sikaflex-1a (13)

    b. Sikaflex Textured Sealant (40)

3. Single Component Silicone:

    a. Sikasil WS 295 (37)

2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.

2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.

3. Open Cell: 40 to 50 percent larger in diameter than joint width.

4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Outlet Box Sealant: Resilient sealer pads; use to seal back and sides of all junction boxes recessed in acoustically-rated partitions.

1. Fire-Rated Partitions: Hevi-Duty Nelson FSP Firestop Putty Pads, or equal (no known equal)

2. Non-Fire-Rated Partitions: Lowry’s Outlet Box Pad, or equal (no known equal).

E. Compressible Tape: 1/4-inch-thick, double-sided, closed-cell foam tape; use to seal interior partitions to window mullions.

1. Norseal V988, 3M 4992, or equal

F. Foam Sealing Tape:

1. General: Open-cell, flexible, polyurethane foam impregnated with synthetic resin and developed to expand into openings and create seals which are airtight, thermally efficient, and vapor permeable.

2. Applications: Door and window shim spaces at heads and jambs, and elsewhere as indicated.

3. Basis-of-Design Product: Tremco Incorporated; ExoAir Trio.

4. Tape Width: As required for intended applications.

G. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

H. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.

1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.

2. Notify Architect of date and time that tests will be performed, at least seven days in advance.

3. Arrange for sealant manufacturer's technical representative to be present during tests.

4. Record each test on Preinstallation Adhesion Test Log as indicated.

5. If any sample fails, review products and installation procedures, consult manufacturer, or take other measures that are necessary to ensure adhesion; retest in a different location; if unable to obtain satisfactory adhesion, report to Architect.

6. After completion of tests, remove remaining sample material and prepare joints for new sealant installation.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

1. Remove paints from joint surfaces except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer.

2. Remove wax, oil, grease, dirt film residues, temporary protective coatings and other residues by wiping with cleaner recommended for that purpose.

3. Remove dust by blowing clean with oil-free, compressed air.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

F. For previously sealed joints, remove all traces of previous sealant and joint backer by mechanical methods, such as by cutting, grinding and wire brushing, in manner not damaging to surrounding surfaces.

3.03 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Install acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:

1. Width/depth ratio of 2:1.

2. Neck dimension no greater than 1/3 of the joint width.

3. Surface bond area on each side not less than 75 percent of joint width.

E. Fit joint backer securely by compressing backer material 25 percent to 40 percent so no displacement occurs during tooling. Avoid stretching or twisting joint backer.

F. Install bond breaker backing tape where backer rod cannot be used, adhering strictly to the manufacturers installation requirements.

G. Prime joint substrates where required. Use and apply primer according to sealant manufacturers recommendations. Confine primers to sealant bond surfaces; do not allow spillage or migration onto adjoining surfaces.

H. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

I. Install sealants to uniform cross-sectional shapes with depths relative to joint widths that allow optimum sealant movement capability as recommended by sealant manufacturer.

J. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

K. Tool sealants in manner that forces sealant against back of joint, ensures firm, full contact at joint interfaces and leaves a finish that is smooth, uniform and free of ridges, wrinkles, sags, air pockets and embedded impurities.

L. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

M. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - NTU Quality Requirements for additional requirements.

B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

C. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.

D. Destructive Adhesion Testing: If there are any failures in first 1,000 linear feet, notify Architect immediately.

E. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

F. Repair destructive test location damage immediately after evaluation and recording of results.

3.05 PROTECTION

A. Protect sealants from contact with contaminating substances and from damage from construction operations. Cut out, remove and replace contaminated or damaged sealants immediately, so that they are without contamination or damage at time of Substantial Completion.

3.06 CLEANING

A. Construction Waste Management: Manage construction waste in accordance with provisions of Section 01 74 19 - NTU Construction Waste Management and Disposal. Submit documentation for CALGreen compliance in accordance with Division 1 Sustainable Design Requirements.

3.07 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width, i.e., at low temperature in thermal cycle. Report failures immediately and repair them.

END OF SECTION

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SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Thermally insulated hollow metal doors with frames.

E. Accessories, including glazing, louvers, and matching panels.

1.02 RELATED REQUIREMENTS

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

B. Section 08 14 16 - NTU Flush Wood Doors.

C. Section 08 71 00 - NTU Door Hardware.

D. Section 08 80 00 - NTU Glazing: Glass for doors and borrowed lites.

E. Section 09 90 00 - NTU Painting and Coating: Field finishing.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. HMMA: Hollow Metal Manufacturers Association.

C. NAAMM: National Association of Architectural Metal Manufacturers.

D. NFPA: National Fire Protection Association.

E. SDI: Steel Door Institute.

F. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2018.

C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames 2020.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

I. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.

J. ASTM C476 - Standard Specification for Grout for Masonry 2022.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

L. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames 2016.

M. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

N. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.

O. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.

P. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2017.

Q. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2014.

R. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames 2019.

1.05 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

C. Shop Drawings: Details of each opening, showing elevations, glazing, louvered or mesh panels, frame profiles, and any indicated finish requirements.

D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

E. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

F. Manufacturer's Qualification Statement.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: https://steeldoor.org/sdi-certified/#sle.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:

1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.

2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.

3. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.

4. Steelcraft, an Allegion brand: www.allegion.com/#sle.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:

1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.

2. Accessibility: Comply with ICC A117.1 and ADA Standards.

3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.

4. Door Edge Profile: Manufacturers standard for application indicated.

5. Typical Door Face Sheets: Flush.

6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.

7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

    a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

    a. Level 3 - Extra Heavy-duty.

    b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.

    c. Model 1 - Full Flush.

    d. Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.

    e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.

2. Door Core Material: Vertical steel stiffeners with fiberglass batts.

    a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.

3. Door Thermal Resistance: R-Value of 2.5 minimum.

4. Door Thickness: 1-3/4 inches, nominal.

5. Top Closures for Outswinging Doors: Flush with top of faces and edges.

6. Weatherstripping: 08 71 00 - Door Hardware.

7. Expanded Metal Mesh Panel: for mechanical room doors.

    a. 13-gauge, carbon steel

    b. Flat

    c. Diamond shape with 1/2" openings.

    d. Painted to match door and frame.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Exterior Door Frames: Full profile/continuously welded type.

1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.

2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.

3. Weatherstripping: 08 71 00 - Door Hardware.

D. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

E. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FINISHES

A. Refer to Section 01 for Sustainable Design Requirements: for low-emitting materials, Architectural Paints and Coatings including aerosol paint and coating systems.

B. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

C. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.06 ACCESSORIES

A. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered corners; prepared for countersink style tamper proof screws.

B. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.

C. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

D. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

E. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.

C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Install door hardware as specified in Section 08 71 00 - Door Hardware.

1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

E. Comply with glazing installation requirements of Section 08 80 00 - Glazing.

F. Coordinate installation of electrical connections to electrical hardware items.

G. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

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SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush configuration; non-rated.

1.02 RELATED REQUIREMENTS

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

B. Section 08 11 13 - Hollow Metal Doors and Frames.

C. Section 08 71 00 - Door Hardware.

D. Section 09 21 16 - Gypsum Board Assemblies.

E. Section 09 90 00 - Painting and Coating: Field finishing of doors.

1.03 REFERENCE STANDARDS

A. ASTM E413 - Classification for Rating Sound Insulation 2022.

B. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights 2019c.

C. AWI (QCP) - Quality Certification Program Current Edition.

D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).

E. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards 2021, with Errata.

F. NEMA LD 3 - High-Pressure Decorative Laminates 2005.

G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.

H. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.

I. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.

J. WDMA I.S. 1A - Interior Architectural Wood Flush Doors 2021, with Errata.

K. WI (CCP) - Certified Compliance Program (CCP) Current Edition.

1.04 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.

3. Product Data for CALGreen 5.504.4.5 – Composite Wood Products: For composite-wood products, showing requirements for formaldehyde as specified in Table 5.504.4.

4. Refer to Section/Division 01 for Sustainable Design Requirements: Requirements for certified wood and low-emitting materials.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

2. Include certification program label.

D. Samples: Submit two samples of door construction, 8 by 8 inches in size cut from top corner of door.

E. Samples: Submit two samples of door veneer, 8 by 8 inches in size illustrating wood grain, stain color, and sheen.

F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

G. Test Reports: Show compliance with specified requirements for the following:

1. Sound-retardant doors and frames; sealed panel tests are not acceptable.

H. Manufacturer's Installation Instructions: Indicate special installation instructions.

I. Manufacturer's qualification statement.

J. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Forest Stewardship Council (FSC) Certified Products:

1. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

2. Forest Certification: Provide components made with not less than 50 percent of wood products obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

C. Woodwork Quality Assurance Program:

1. Comply with AWI (QCP) woodwork association quality assurance service/program in accordance with requirements for work specified in this section; www.awiqcp.org/#sle.

2. Comply with WI (CCP) woodwork association quality assurance service/program in accordance with requirements for work specified in this section; www.woodworkinstitute.com/#sle.

3. Provide labels indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.

4. Provide designated labels on shop drawings as required by quality assurance program.

5. Provide designated labels on installed products as required by quality assurance program.

6. Submit documentation upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging and inspect for damage.

C. Protect doors with resilient packaging. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 01 for Project Record Drawings and for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. High Pressure Decorative Laminate (HPDL) Faced Doors:

1. Oregon Door: www.oregondoor.com/#sle.

2. Masonite Architectural; Aspiro Choice Laminate Doors: www.architectural.masonite.com/#sle.

3. VT Industries, Inc: www.vtindustries.com/#sle.

2.02 DOORS AND PANELS

A. Doors: See drawings for locations and additional requirements.

1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2. High Pressure Decorative Laminate (HPDL) Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.

1. Provide solid core doors at each location.

2. High pressure decorative laminate (HPDL) **finish for all restroom doors: Laminart "Amber Elm"**

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type structural composite lumber core (SCLC), plies and faces as indicated.

2.04 DOOR FACINGS

A. High Pressure Decorative Laminate (HPDL) Facing for Non-Fire-Rated Doors: NEMA LD 3, HGS; color as selected; textured, low gloss finish.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

1. Provide solid blocks at lock edge for hardware reinforcement.

2. Provide solid blocking for other through bolted hardware.

C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

F. Provide edge clearances in accordance with the quality standard specified.

2.06 ACCESSORIES

A. Hollow Metal Door Frames: See Section 08 11 13 - Hollow Metal Doors and Frames.

B. Door Hardware: See Section 08 71 00 - Door Hardware.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

1. Install fire-rated doors in accordance with NFPA 80 requirements.

2. Install smoke and draft control doors in accordance with NFPA 105 requirements.

3. Install exterior doors in accordance with ASTM E2112.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Field-Finished Doors: Trimming to fit is acceptable.

1. Adjust width of non-rated doors by cutting equally on both jamb edges.

2. Trim maximum of 3/4 inch off bottom edges.

D. Use machine tools to cut or drill for hardware.

E. Coordinate installation of doors with installation of frames and hardware.

F. Install door louvers plumb and level.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 08 31 00 - ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall- and ceiling-mounted access units.

1.02 RELATED REQUIREMENTS

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

B. Section 08 71 00 - Door Hardware: Mortise cylinder and core hardware.

C. Section 09 90 00 - Painting and Coating: Field paint finish.

D. Divisions 21 through 26: Fire Protection, Plumbing, Mechanical and Electrical components requiring access.

E. Division 23: Air duct accessories. Access doors in ductwork.

1.03 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products Current Edition.

B. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

A. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

B. Shop Drawings: Indicate exact position of each access door and/or panel unit.

C. Project Record Documents: Record actual locations of each access unit.

PART 2 PRODUCTS

2.01 WALL AND CEILING-MOUNTED ACCESS UNITS

A. Manufacturers:

1. Babcock-Davis: www.babcockdavis.com/#sle.
2. Karp Associates, Inc: www.karpinc.com/#sle.
3. Milcor, Inc: www.milcorinc.com/#sle.
4. Nystrom, Inc: www.nystrom.com/#sle.

B. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.

1. Material: Steel.

2. Style: Recessed door panel for infill with wall/ceiling finish.

a. Gypsum Board Mounting Criteria: Use drywall bead type frame.

3. Frames: 16-gauge, 0.0598 inch, minimum thickness.

4. Door Panels to Receive Wall/Ceiling Finish: Surface recessed 5/8 inch back from wall face.

5. Insulation: Non-combustible mineral wool or glass fiber.

6. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.

a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.

7. Steel Finish: Primed.

8. Primed and Factory Finish: Polyester powder coat; color to match adjacent wall finish.

9. Hardware:

a. Hardware for Fire-Rated Units: As required for listing.

b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.

c. Latch/Lock: Tamperproof tool-operated cam latch.

d. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.

e. Inside Latch Release: Mechanism that allows door/panel to be opened from inside.

f. Gasketing: Extruded neoprene, around perimeter of door panel.

C. Wall-Mounted Units in Wet Areas and all areas with ceramic tile wall finish:

1. Locations and sizes as indicated on the drawings. Minimum sizes as required by code for the component to be accessed.

2. Location: As indicated on drawings.

3. Panel Material: Stainless steel, Type 304.

4. Size: 12 by 12 inches, minimum.

5. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

6. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

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SECTION 08 43 13 - NTU ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Venting windows.

C. Manual window control systems.

D. Weatherstripping.

1.02 RELATED REQUIREMENTS

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

B. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

C. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.

D. Section 08 80 00 - Glazing: Glass. Glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site 2015.

B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems 2015.

C. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems 2014.

D. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.

E. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.

F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2020, with Errata (2022).

G. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.

H. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

J. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2021a.

K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

L. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

M. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2019.

N. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014 (Reapproved 2021).

O. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).

P. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors 2002 (Reapproved 2018).

Q. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference 2015.

R. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.

C. Samples: Submit two samples minimum 12 x 12 inches in size illustrating finished aluminum surface, glass, infill panels, glazing materials.

D. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

E. Certificate of NFRC Compliance and test report including center-of-glass U value and corresponding overall U value.

F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

G. Field Quality Control Submittals: Report on field testing for water penetration and air leakage.

H. Manufacturer's qualification statement.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.

a. Insulating Glass Certification Council (IGCC).

b. Safety Glazing Certification Council (SGCC).

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1. Provide company name, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.

a. North American Contractor Certification (NACC) for glazing contractors.

b. Equivalent independent third-party ANSI accredited certification.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when the ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 01 for Project Record Document requirements and for additional warranty requirements.

B. Correct defective Work within a five-year period after Date of Substantial Completion.

C. Provide 10-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Special Finish Warranty for High-Performance Organic Coatings: Provide 20-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Kawneer North America www.kawneer.com/#sle.

B. Other Acceptable - Aluminum-Framed Storefronts Manufacturers, subject to compatibility with configurations shown in the drawings:

1. Arcadia, Inc: www.arcadiainc.com/#sle.

2. C.R. Laurence Company, Inc; U.S. Aluminum: www.crl-arch.com/#sle.

3. Oldcastle Building Envelope: www.oldcastlebe.com/#sle.

C. Storefronts, entrances, and venting windows shall all be products of the Storefront Manufacturer and shall be designed for compatibility and consistent performance characteristics.

2.02 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage, and attachment devices, thermally broken with interior section insulated from exterior.

1. Glazing Rabbet: For 1 inch insulating glazing.

2. Glazing Position: Center-set.

3. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

4. Finish: Clear anodized aluminum.

5. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.

6. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.

7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

8. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12-hour period without causing detrimental effect to system components, anchorages, and other building elements.

9. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.

10. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements

1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.

   a. Design Wind Loads: Comply with requirements of ASCE 7.

   b. Positive Design Wind Load: 25 lbf/sq ft.

   c. Negative Design Wind Load: 25 lbf/sq ft.

   d. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.

3. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.

4. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.

5. Overall U-value Including Glazing: 0.45 Btu/(hr sq ft deg F), maximum.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.

1. Framing members for interior applications need not be thermally broken.

2. Glazing Stops: Flush.

3. Structurally Reinforced Members: Where required provide Extruded aluminum with internal reinforcement of structural steel member.

4. Thermal break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

B. Glazing: See Section 08 80 00 - Glazing.

2.04 VENTING WINDOWS

A. Basis-of-Design Product: Kawneer North America's "GLASSvent" with flush vent, minimum-sightline design.

B. Aluminum Windows: Manufacturer's standard units for manual or motorized operation, complying with AAMA/WDMA/CSA 101/I.S.2/A440, with self-flashing mounting fins, and as follows:

1. Window Type: Awning (project-out).

2. Minimum Performance Class: CW.

3. Minimum Performance Grade: 30.

4. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 0.064-inch thickness at any location for main frame and sash members.

5. Thermally Improved Construction: Fabricate window units with an integral, and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact.

C. Mullions: Between adjacent windows, fabricated of extruded aluminum matching finish of window units.

D. Fasteners, Anchors, and Clips: Nonmagnetic stainless steel, aluminum, or other noncorrosive material, compatible with aluminum window members, trim, hardware, anchors, and other components of window units. Fasteners shall not be exposed, except for attaching hardware.

1. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.128 inch thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard, noncorrosive, pressed-in, spline grommet nuts.

E. Hardware: Manufacturer's standard; of aluminum, stainless steel, die-cast steel, malleable iron, or bronze.

1. Where size of operable window units exceeds capabilities and functionality of manufacturer's standard hardware, provide manufacturer's special hardware for hinges, limit device locking arm controls, and multi-latch or multiple separate cam latch lever locks, as required to meet performance requirements and to suit size of window sash.

F. Glazing: Same as adjacent aluminum-framed entrances and storefront glazing.

G. Finish: Match adjacent aluminum-framed entrances and storefront finish.

H. Window Screens: Extruded aluminum frames, 6063-T6 alloy and temper, joined at corners. 18 x 16 mesh fiberglass screen cloth. Frames finished to match windows. Removable extruded vinyl splines. Provide units with framed cutouts for access to operating hardware.

2.05 WINDOW CONTROL SYSTEMS

A. Basis-of-Design Products: Bronze Craft Corporation / Ultraflex Control Systems' (UCS), or equal, mechanical window remote control system.

B. Performance Requirements: System shall provide group and individual window operation as indicated.

C. Components: Provide all mounting brackets, hardware, and other required and accessory items for a complete and operational installation.

1. Chain opening mechanisms with stainless steel chain and opening stroke of 10" or 15" as appropriate for window height and hinges used. The connection of the chain bracket to the operable window must have a release pin to allow dis-connection of the chain to the window for cleaning.

D. Manual Operation Systems: UCS Mecline

1. Control operator with full metal cover enclosing spent travel conduit. Control operator will have a 5:1 gear ratio and a removable crank handle.

2. Transmission elements including, steel helical wrapped cable, steel conduit coated in PVC and lined with polyethylene tubing to reduce friction, conduit connectors, lock springs, and end plugs. Conduit mounting brackets must be used as indicated in project specific shop drawings prepared by window control system provider.

3. Aluminum mounting brackets for the chain opener must be made to properly fasten the opener to the window frame extrusion in a structurally secure location.

2.06 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209/B209M.

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Fasteners: Stainless steel.

E. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch minimum thickness; finish to match framing members.

F. Concealed Flashings: Stainless steel, 26 gauge, 0.0187 inch minimum thickness.

G. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.

H. Sealant for Setting Thresholds: Non-curing butyl type.

I. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

J. Glazing: See Section 08 80 00 - Glazing

K. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.07 FINISHES

A. Factory finish all surfaces that will be exposed in completed assemblies.

1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

2. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

B. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

C. Color: As selected by Architect from manufacturer's standard range.

D. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install all systems in accordance with manufacturer's instructions.

B. Provide alignment attachments and shims to permanently fasten system to building structure.

C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

D. Provide thermal isolation where components penetrate or disrupt building insulation.

E. Install sill pan-flashings. Turn up ends and edges; seal to adjacent work to form watertight dam.

F. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

H. Install operating sash.

I. Install hardware using templates provided.

J. Install glass and infill panels using glazing method required to achieve performance criteria; see Section 08 80 00 - Glazing.

K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

A. Provide services of storefront manufacturer's field representative to observe for proper installation of system and submit report.

B. See Section 01 Quality Requirements for general testing and inspection requirements.

C. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.

1. Perform a minimum of two tests in each designated area as indicated on drawings.

2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

D. Provide field testing of installed storefront system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.

1. Perform a minimum of two tests in each designated area as indicated on drawings.

2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 4.18 psf.

a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.

4. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf.

E. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following, but is not necessarily limited to:

1. Door Hardware, including electric hardware.
2. Storefront and Entrance door hardware.
3. Gate Hardware.
4. Digital keypad access control devices.
5. Hold-open closers with smoke detectors.
6. Wall or floor-mounted electromagnetic hold-open devices.
7. Power supplies for electric hardware.
8. Low-energy door operators plus sensors and actuators.
9. Thresholds, gasketing and weather-stripping.
10. Door silencers or mutes.

C. Related Sections: The following sections are noted as containing requirements that relate to this Section, but may not be limited to this listing.

1. Division 8: Section - Steel Doors and Frames.
2. Division 8: Section - Wood Doors.
3. Division 8: Section - Aluminum Storefront
4. Division 28: Section - Fire/Life-Safety Systems & Security Access Systems.

1.03 REFERENCES (USE DATE OF STANDARD IN EFFECT AS OF BID DATE.)

A. 2022 California Building Code, CCR, Title 24.

B. BHMA – Builders' Hardware Manufacturers Association

C. CCR – California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.

D. DHI – Door and Hardware Institute

E. NFPA - National Fire Protection Association.

1. NFPA 80 - Fire Doors and Other Opening Protectives
2. NFPA 105 - Smoke and Draft Control Door Assemblies

F. UL - Underwriters Laboratories.

1. UL 10C - Fire Tests of Door Assemblies
2. UL 305 - Panic Hardware

G. WHI - Warnock Hersey Incorporated

H. SDI - Steel Door Institute

1.04 SUBMITTALS & SUBSTITUTIONS

A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.

B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

C. Submit six (6) copies of schedule organized vertically into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:

1. Include a Cover Sheet with;
   a. Job Name, location, telephone number.
   b. Architects name, location and telephone number.
   c. Contractors name, location, telephone number and job number.
   d. Suppliers name, location, telephone number and job number.
   e. Hardware consultant's name, location and telephone number.

2. Job Index information included;
   a. Numerical door number index including; door number, hardware heading number and page number.
   b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
   c. Manufacturers' names and abbreviations for all materials.
   d. Explanation of abbreviations, symbols, and codes used in the schedule.
   e. Mounting locations for hardware.
   f. Clarification statements or questions.
   g. Catalog cuts and manufacturer’s technical data and instructions.

3. Vertical schedule format sample:

Heading Number 1 (Hardware group or set number – HW -1)					
			(a) 1 Single Door #1 - Exterior from Corridor 101	(b) 90°	(c) RH
			(d) 3' 0"x7' 0" x 1-3/4" x (e) 20 Minute (f) WD x HM		
(g) 1	(h)	(i) ea	(j) Hinges - (k) 5BB1HW 4.5 x 4.5 NRP (l) ½ TMS	(m) 626	(n) IVE
2	6AA	1 ea	Lockset - ND50PD x RHO x RH x 10-025 x JTMS	626	SCH

(a) - Single or pair with opening number and location. (b) - Degree of opening (c) - Hand of door(s) (d) - Door and frame dimensions and door thickness. (e) - Label requirements if any. (f) - Door by frame material. (g) - (Optional) Hardware item line #. (h) - Keyset

Symbol. (i) - Quantity. (j) - Product description. (k) - Product Number. (l) - Fastenings and other pertinent information. (m) - Hardware finish codes per ANSI A156.18. (n) - Manufacture abbreviation.

D. Make substitution requests in accordance with Division 1. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.

E. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.

F. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

G. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

H. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.

I. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

J. LEED Certification Points: Submit information and certifications necessary to achieve maximum points for LEED certification; coordinate and cooperate with Owner and Architect in providing information necessary for required LEED rating.

1.05 QUALITY ASSURANCE

A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

1. Responsible for detailing, scheduling and ordering of finish hardware.
2. Meet with Owner to finalize keying requirements and to obtain final instructions in writing.
3. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.

C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.

D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given

type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.

1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

1.06 DELIVERY, STORAGE AND HANDLING

A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.

B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.

C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.

D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.

E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

F. Product packaging to be labelled in compliance with CA Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986.

1.07 WARRANTY

A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:

1. Locksets: "ND" Ten (10) years.
2. Electronic: One (1) year.
3. Closers: Thirty (30) years.
4. Exit devices: Three (3) years.
5. All other hardware: Two (2) years.

1.08 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.09 PRE-INSTALLATION CONFERENCE

A. Convene a pre-installation conference at least one week prior to beginning work of this section.

B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key District Personnel, and Project Inspector.

C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review District's keying standards.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Item	Manufacturer	Acceptable Substitutes
Hinges	Ives	Hager, Stanley, McKinney
Locks, Latches & Cylinders	Schlage	Or Approved Equal
Exit Devices	Von Duprin	Or Approved Equal
Closers	LCN	Or Approved Equal
Push, Pulls & Protection Plates	Ives	Trimco, BBW, DCI
Flush Bolts	Ives	Trimco, BBW, DCI
Dust Proof Strikes	Ives	Trimco, BBW, DCI
Coordinators	Ives	Trimco, BBW, DCI
Stops	Ives	Trimco, BBW, DCI
Overhead Stops	Glynn-Johnson	Or Approved Equal
Thresholds	Zero	Pemko, National Guard
Seals & Bottoms	Zero	Pemko, National Guard

2.02 MATERIALS

A. Hinges: Exterior out-swinging door butts shall be non-ferrous material and shall have stainless steel hinge pins. All doors to have non-rising pins.

1. Hinges shall be sized in accordance with the following:
   a. Height:
      1) Doors up to 42" wide: 4-1/2" inches.
      2) Doors 43" to 48" wide: 5 inches.
   b. Width: Sufficient to clear frame and trim when door swings 180 degrees.
   c. Number of Hinges: Furnish 3 hinges per leaf to 7'-5" in height. Add one for each additional 2 feet in height.

2. Furnish non-removable pins (NRP) at all exterior out-swing doors and interior key lock doors with reverse bevels.

B. Floor Closers: Shall be equipped with compression springs, cam and roller operating mechanism and a one piece spindle-cam for maximum operating performance and longevity.

C. Pivots: High strength forgings and castings with precision bearings for smooth operation. Positive locking vertical adjustment mechanism to allow installer to precisely position the door and balance the load.

D. Continuous Hinges: As manufactured by Ives, an Allegion Company. UL rated as required.

E. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Rhodes" design, fastened with through-bolts and threaded chassis hubs.

1. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
   a. Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
   b. Offset lever pull – minimum 1,600 foot pounds without gaining access
   c. Vertical lever impact – minimum 100 impacts without gaining access

2. Cycle life - tested to minimum 16 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers
3. UL 10C for 4’-0” x 10’-0” 3-hour fire door.
4. Cylinders: Refer to “KEYING” article, herein.
5. Provide solid steel anti-rotation through bolts and posts to control excessive rotation of lever.
6. Provide lockset that allows lock function to be changed to over twenty other common functions by swapping easily accessible parts.
7. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw capable of UL listing of 3 hours on a 4’ x 10’ opening. Provide proper latch throw for UL listing at pairs.
8. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
9. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
10. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
11. Provide wired electrified options as scheduled in the hardware sets.
    a. 12 through 24 volt DC operating capability, auto-detecting
    b. Selectable EL (fail safe)/EU (fail secure) operating mode via switch on chassis
    c. 0.230A (230mA) maximum current draw
    d. 0.010A (10mA) holding current
    e. Modular / “plug in” request to exit switch

12. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.

F. Closers: LCN as scheduled. Place closers inside building, stairs, room, etc.

1. Door closer cylinders shall be of high strength cast iron construction with double heat treated pinion shaft to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
2. All door closers shall be fully hydraulic and have full rack and pinion action with a shaft diameter of a minimum of 11/16 inch and piston diameter of 1 inch to ensure longevity and durability under all closer applications.
3. All parallel arm closers shall incorporate one piece solid forged steel arms with bronze bushings. 1-9/16” steel stud shoulder bolts, shall be incorporated in regular arms, hold-open arms, arms with hold open and stop built in. All other closers to have forged steel main arms for strength, durability, and aesthetics for versatility of trim accommodation, high strength and long life.

4. All parallel arm closers so detailed shall provide advanced backcheck for doors subject to severe abuse or extreme wind conditions. This advanced backcheck shall be located to begin cushioning the opening swing of the door at approximately 45 degrees. The intensity of the backcheck shall be fully adjustable by tamper resistant non-critical screw valve.
5. Closers shall be installed to permit doors to swing 180 degrees.
6. All closers shall utilize a stable fluid withstanding temperature range of 120 degrees F. to -30 degrees F. without requiring seasonal adjustment of closer speed to properly close the door.
7. Provide the manufactures drop plates, brackets and spacers as required at narrow head rails and special frame conditions. NO wood plates or spacers will be allowed.
8. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. Per 11B-404.2.8.1, door shall take at least 5 seconds to move from an open position of 90 degrees to a position of 12 degrees from the latch jamb.

G. Schlage “L” Series as scheduled with “06” Style Lever and “N” Style Escutcheon.

1. Locksets to comply with ANSI A156.13, Series 1000, Operational Grade 1 and Security Grade 1 with all standard trims. Locksets shall also comply with UL10C Positive Pressure requirements
2. Lock case shall be manufactured with heavy 12 gauge steel with fully wrapped design. Lock cases with exposed edges are not acceptable. Lock case shall be multi-functional allowing transformation to a different function without opening lock case.
3. Latchbolt shall have ¾” throw and be non-handed, field reversible without opening the lock case. Solid latchbolts and / or plastic anti-friction devices are not acceptable.
4. The deadbolt, when used, shall be 1” throw stainless steel with a ¾” internal engagement when fully extended.
5. All trim shall be through-bolted with the spring cages supporting the trim attached to the lock cases to prevent torqueing.
6. Levers to have independent rotation in both directions. Exterior lever assembly to be one-piece design attached by threaded bushing. Interior lever assembly shall be attached by screwless shank
7. Thru-bolt lever assemblies through the door for positive interlock. Locks using a through the door spindle for attachment are not acceptable. Spindles shall be independent, designed to “break-away” at a maximum of 75psi torque.
8. Hand of lock chassis to be changeable by simply moving one screw from one side to the case to the other and pulling and reversing the latchbolt.
9. Cylinders to be secured by a cast stainless steel, dual retainer. Locks utilizing screws and / or stamped retainers are not acceptable.

H. Flush Bolts & Dust Proof Strikes: Automatic Flush Bolts shall be of the low operating force design. Utilize the top bolt only model for interior doors where applicable and as permitted by testing procedures.

1. Manual flush bolts only permitted on storage or mechanical openings as scheduled.
2. Provide dust proof strikes at openings using bottom bolts.

I. Door Stops:

1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.
2. Do not install floor stops more than four (4) inches from the face of the wall or partition (CBC Section 11B-307).
3. Overhead stops shall be made of stainless steel and non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

J. Protection Plates: Fabricate either kick, armor, or mop plates with four beveled edges. Provide kick plates 10" high and 2" LDW. Sizes of armor and mop plates shall be listed in the Hardware Schedule. Furnish with machine or wood screws of bronze or stainless to match other hardware.

K. Thresholds: As Scheduled and per details.

1. Thresholds shall not exceed 1/2" in height, with a beveled surface of 1:2 maximum slope.
2. Set thresholds in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 7 “Thermal and Moisture Protection”.
3. Use ¼” fasteners, red-head flat-head sleeve anchors (SS/FHSL).
4. Thresholds shall comply with CBC Section 11B-404.2.5.

L. Seals: Provide silicone gasket at all rated and exterior doors.

1. Fire-rated Doors, Resilient Seals: UL10C Classified complies with NFPA 80 & NFPA 252. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements.
2. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C Classified complies with NFPA 80 & NFPA 252. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required.
3. Smoke & Draft Control Doors, Provide UL10C Classified complies with NFPA 80 & NFPA 252 for use on “S” labeled Positive Pressure door assemblies.

M. Door Shoes & Door Top Caps: Provide door shoes at all exterior wood doors and top caps at all exterior out-swing doors.

N. Silencers: Furnish silencers for interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Omit where sound or light seals occurs, or for fire-resistive-rated door assemblies.

2.03 KEYING

A. Furnish all cylinders in the Schlage conventional style except the exit device and removable mullion cylinders which will be supplied in Schlage Full Size Interchangeable Core (FSIC). Pack change keys independently (PKI).

B. Furnish construction keying for doors requiring locking during construction.

1. For “Split Key” Construction Cylinders (non-IC cylinders) specify **“**CK**”** for each keyed cylinder.
2. Provide ten Construction Keys (48-104 “Classic”, 48-008 “Everest”)
3. Provide two Extractor Tools (35-057)

C. Furnish all keys with visual key control.

1. Stamp key “Do Not Duplicate”.

2. Stamp (BHMA) key symbol on key.

D. Furnish all cylinders with visual key control.

1. Stamp (BHMA) key symbol on side of cylinder (CKC).

E. Furnish mechanical keys as follows:

1. Furnish 2 cut change keys for each different change key code.
2. Furnish 1 uncut key blank for each change key code.
3. Furnish 6 cut masterkeys for each different masterkey set.
4. Furnish 3 uncut key blanks for each masterkey set.
5. Furnish 2 cut control keys cut to the top masterkey for permanent I/C cylinders.
6. Furnish 1 cut control key cut to each SKD combination.

F. Furnish Schlage Padlocks and the cylinders to tie them into the masterkey system for gates, storage boxes, utility valve security, roof hatches and roll-up doors keyed as directed in the keying schedule.

1. Furnish KS43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47-413 (conventional) or 47-743-XP (PrimusXP) with above.
2. Furnish KS43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic / Everest) or 20-740 (PrimusXP) with above.
3. Furnish KS41D1200 padlock for use with SFIC Schlage cylinders. Furnish 80-037 (Everest-B) with above.

G. Furnish one Schlage cabinet lock for each cabinet door or drawer so designated on the drawings or keying schedule to match the masterkey system.

1. Furnish CL100PB for use with non-I/C Schlage cylinders.
2. Furnish CL77R for use with FSIC Schlage cylinders.
3. Furnish CL721G for use with SFIC Schlage cylinders.

2.04 FINISHES

A. Generally to be satin chrome US26D (626 on bronze and 652 on steel) unless otherwise noted.

B. Furnish push plates, pull plates and kick or armor plates in satin stainless steel US32D (630) unless otherwise noted.

C. Door closers shall be powder-coated to match other hardware, unless otherwise noted.

D. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

2.05 FASTENERS

A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.

B. Screws for butt hinges shall be flathead, countersunk, full-thread type.

C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.

D. Provide expansion anchors for attaching hardware items to concrete or masonry.

E. All exposed fasteners shall have a phillips head.

F. Finish of exposed screws to match surface finish of hardware or other adjacent work.

G. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.

B. Use the templates provided by hardware item manufacturer.

C. Mounting heights for hardware shall be as recommended by the Door and Hardware Institute. Operating hardware will to be located between 34" and 44" AFF.

D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set thresholds for exterior doors in full bed of butyl-rubber sealant.

G. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.

H. Hardware Installer shall coordinate with security contractor to route cable to connect electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.

I. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to insure proper and secure operation.

J. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.

K. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.

L. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer's technical documentation.

3.03 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surface soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.04 HARDWARE LOCATIONS

A. Conform to CCR, Title 24, Part 2; and ADAAG; and the drawings for access-compliant positioning requirements for the disabled.

3.05 FIELD QUALITY CONTROL

A. Contractor is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

3.06 SCHEDULE

A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.

B. While the hardware schedule is intended to cover all doors, and other movable parts of the building, and establish type and standard of quality, the contractor is responsible for examining the Plans and Specifications and furnishing proper hardware for all openings whether listed or not. If there are any omissions in hardware groups in regard to regular doors they shall be called to the attention of the Architect prior to bid opening for instruction; otherwise, list will be considered Complete. No extras will be allowed for omissions.

C. The Door Schedule on the Drawings indicates which hardware set is used with each door.

Manufacturers Abbreviations (Mfr.)

ADA	=	Adams Rite Mfg.	Aluminum Door Hardware
GLY	=	Glynn-Johnson Corporation	Overhead Door Stops
IVE	=	Ives	Hinges, Pivots, Bolts, Coordinators, Dust Proof Strikes, Push Pull & Kick Plates, Door Stops & Silencers
JOH	=	L.E. Johnson	Sliding Door Hardware
LCN	=	LCN	Door Closers
SCE	=	Schlage Electronics	Electronic Door Components
SCH	=	Schlage Lock Company	Locks, Latches & Cylinders
TRI	=	Trimco	Signs
VON	=	Von Duprin	Exit Devices
ZER	=	Zero International	Thresholds, Gasketing & Weather-stripping

HARDWARE GROUP NO. 01

For use on Door #(s):

13

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	ND80PD RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	153A	A	ZER
1	EA	THRESHOLD	PER DETAIL	AL	ZER

HARDWARE GROUP NO. 02

For use on Door #(s):

02

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	STOREROOM LOCK	ND80PD RHO	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	FLOOR STOP	FS18S	BLK	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	ASTRAGAL	43STST	STST	ZER
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	PER DETAIL	AL	ZER

HARDWARE GROUP NO. 03
For use on Door #(s):
11

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	STOREROOM LOCK	ND80PD RHO	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	FLOOR STOP	FS18S	BLK	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	ASTRAGAL	43STST	STST	ZER
1	EA	THRESHOLD	PER DETAIL	AL	ZER

HARDWARE GROUP NO. 04
For use on Door #(s):
04 05 09

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY W/ INDICATOR	L9056P 06A L583-363 L283-722	626	SCH
1	EA	MOP PLATE	8400 16" X 2" LDW B-CS	630	IVE
1	EA	KICK PLATE	8400 16" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE GROUP NO. 05
For use on Door #(s):
06 07 08

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY W/ INDICATOR	L9056P 06A L583-363 L283-722	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	MOP PLATE	8400 16" X 2" LDW B-CS	630	IVE
1	EA	KICK PLATE	8400 16" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE GROUP NO. 06

For use on Door #(s):

12

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80PD RHO	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	GASKETING	188SBK PSA	BK	ZER

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing compounds.

1.02 RELATED REQUIREMENTS

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

B. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.

C. Section 08 43 13 - Aluminum-Framed Storefronts.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015 (Reaffirmed 2020).

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers 2005 (Reapproved 2019).

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

F. ASTM C1036 - Standard Specification for Flat Glass 2021.

G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.

H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass 2019.

I. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

J. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass 2021a.

K. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings 2016.

L. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2019.

M. GANA (GM) - GANA Glazing Manual 2008.

N. GANA (SM) - GANA Sealant Manual 2008.

O. GANA (LGRM) - Laminated Glazing Reference Manual 2019.

P. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Q. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use 1990 (2016).

R. ITS (DIR) - Directory of Listed Products Current Edition.

S. NFRC 100 - Procedure for Determining Fenestration Product U-factors 2020.

T. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence 2020.

U. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems 2020.

V. UL (DIR) - Online Certifications Directory Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

A. Product Data on Insulating Glass Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

B. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

C. Certificate: Certify that products of this section meet or exceed specified requirements.

D. Manufacturer's qualification statement.

E. Installer's qualification statement.

F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods. Maintain one copy on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with a minimum of three years of documented experience.

1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.

a. Insulating Glass Certification Council (IGCC).

b. Safety Glazing Certification Council (SGCC).

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.

a. North American Contractor Certification (NACC) for glazing contractors.

b. Equivalent independent third-party ANSI accredited certification.

1.07 FIELD CONDITIONS

A. Do not install glazing when the ambient temperature is less than 40 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY

A. See Division 01 for Project Record Drawings and for additional warranty requirements.

B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

D. Heat-Soaked Tempered Glass: Provide a five (5) year manufacturer warranty to include coverage for spontaneous breakage of fully tempered glass caused by nickel sulfide (NiS) inclusions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glass Fabricators:

1. GGI - General Glass International: www.generalglass.com/#sle.

2. Standard Bent Glass Corp: www.standardbent.com/#sle.

3. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.

4. Viracon, Inc: www.viracon.com/#sle.

B. Float Glass Manufacturers:

1. Guardian Glass, LLC: www.guardianglass.com/#sle.

2. Pilkington North America Inc: www.pilkington.com/na/#sle.

3. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.

C. Laminated Glass Manufacturers:

1. Viracon, Architectural Glass segment of Apogee Enterprises, Inc : www.viracon.com/#sle.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.

1. Design Pressure: Calculated in accordance with ASCE 7.

2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.

3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7

4. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.

5. Glass thicknesses listed are minimum.

B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.

1. In conjunction with weather barrier related materials described in other sections, as follows:

a. Water-Resistive Barriers: See Section 07 25 00 - WORKING Weather Barriers.

b. Air Barriers: See Section 07 27 00 - NTU Air Barriers.

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:

1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.

2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.

3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

A. **Thicknesses: As indicated and as recommended by glass manufacturer and fabricator for the applications indicated.**

B. Float Glass: Provide float glass based glazing unless otherwise indicated.

1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.

2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.

3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.

4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.

5. Heat-Soak Testing (HST): Provide HST of fully tempered glass used on canopy, point-supported, spider wall, high-risk, sloping overhead, horizontal overhead, free-standing glass protective barrier, or other demanding applications of project, to reduce risks of spontaneous breakage due to nickel sulfide (NiS) induced fractures in accordance with industry established testing requirements.

C. Laminated Glass: Float glass laminated in accordance with ASTM C1172.

1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.

2. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.

2.04 INSULATING GLASS UNITS

A. Manufacturers:

1. Guardian Glass, LLC: www.guardianglass.com/#sle.

2. Pilkington North America Inc: www.pilkington.com/na/#sle.Pilkington North America Inc: www.pilkington.com/na/#sle.

3. Viracon, Apogee Enterprises, Inc: www.viracon.com/#sle.

4. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.

B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

C. **Thicknesses: As indicated and as recommended by glass manufacturer and fabricator for the applications indicated.**

D. Insulating Glass Units:

1. Durability: Certified by an independent testing agency to comply with ASTM E2190.

2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.

3. Warm-Edge Spacers: Low-conductivity thermoplastic with dessicant warm-edge technology design.

   a. Spacer Width: As required for specified insulating glass unit.

   b. Spacer Height: Manufacturer's standard.

   c. Products:

      1) Quanex IG Systems, Inc; Super Spacer TriSeal: www.quanex.com/#sle.

      2) Technoform Glass Insulation; TGI-Spacer: www.glassinsulation.us/#sle.

4. Spacer Color: Black.

5. Edge Seal:

   a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.

6. Color: Black.

7. Purge interpane space with dry air, hermetically sealed.

8. Capillary Tubes: Provide tubes from air space for insulating glass units without inert type gas that have a change of altitude greater than 2500 feet between point of fabrication and point of installation to permit pressure equalization of air space.

   a. Capillary Tubes: Tubes to remain open and be of length and material type in accordance with insulating glass fabricator's requirements.

E. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.

1. Applications: Exterior glazing unless otherwise indicated.

2. Space between lites filled with air.

3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum: Vitro Solarban 70

   a. Tint: Clear.

   b. Coating: Self-cleaning type, on #1 surface.

   c. Coating: Low-E (passive type), on #2 surface.

4. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.

   a. Tint: Clear.

5. Total Thickness: 1 inch.

6. Thermal Transmittance (U-Value), Winter - Center of Glass: .28, nominal.

7. Visible Light Transmittance (VLT): 64 percent, nominal.

8. Solar Heat Gain Coefficient (SHGC): .27, nominal.

9. Visible Light Reflectance, Outside: 13 percent, nominal.

10. Glazing Method: Dry glazing method, gasket glazing.

2.05 GLAZING COMPOUNDS

A. Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; gray color.

B. Butyl Sealant: Single component; ASTM C920 Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

C. Polysulfide Sealant: Two component; chemical curing, non-sagging type; ASTM C920 Type M, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

D. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; _____ color.

E. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; _____ color.

F. Manufacturers:

   1. Bostik Inc: www.bostik-us.com/#sle.

   2. Dow Corning Corporation: www.dowcorning.com/construction/#sle.Dow Corning Corporation: www.dowcorning.com/construction/#sle.

   3. Pecora Corporation: www.pecora.com/#sle.

   4. Tremco Commercial Sealants & Waterproofing; Proglaze: www.tremcosealants.com/#sle.

2.06 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.

1. Width: As required for application.

2. Thickness: As required for application.

3. Spacer Rod Diameter: As required for application.

4. Manufacturers:

a. Pecora Corporation: www.pecora.com/#sle.

b. Tremco Global Sealants: www.tremcosealants.com/#sle.

D. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal.

1. Manufacturers:

a. Pecora Corporation: www.pecora.com/#sle.

b. Saint-Gobain Performance Plastics: www.plastics.saint-gobain.com/#sle.

E. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

F. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that the minimum required face and edge clearances are being provided.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

D. Verify that sealing between joints of glass framing members has been completed effectively.

E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.

E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.

F. Carefully trim protruding tape with knife.

3.06 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Remove nonpermanent labels immediately after glazing installation is complete.

C. Clean glass and adjacent surfaces after sealants are fully cured.

D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.07 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

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SECTION 08 83 00 - MIRRORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass mirrors.

1. Annealed float glass.

1.02 RELATED REQUIREMENTS

A. Section 06 20 00 - Finish Carpentry: Wood mirror frames.

B. Section 10 28 00 - Commercial Toilet Accessories: Metal mirror frames.

1.03 REFERENCE STANDARDS

A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

B. ASTM C1036 - Standard Specification for Flat Glass 2021.

C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.

D. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

E. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror 2018.

F. GANA (GM) - GANA Glazing Manual 2008.

G. GANA (SM) - GANA Sealant Manual 2008.

1.04 SUBMITTALS

A. See Division 01 for Administrative Requirements, for submittal procedures.

B. Product Data on Mirror Types: Submit structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Manufacturer's Certificate: Certify that mirrors, meets or exceeds specified requirements.

D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods.

1.06 FIELD CONDITIONS

A. Do not install mirrors when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. See Division 01 for Closeout Submittals, and for additional warranty requirements.

B. Provide five-year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Mirrors:

1. Lenoir Mirror Co: www.lenoirmirror.com/#sle.

2. Walker Glass Company Ltd; Walker Glass Mirrors: www.walkerglass.com/#sle.

2.02 MATERIALS

A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.

B. Mirror Glass: for restrooms; ASTM C1036, Type 1 - Transparent Flat, Class 1 - Clear, Quality - Q1 (high-quality mirrors); silvering, protective coating, and quality requirements in compliance with ASTM C1503.

1. Thickness: 1/4 inch.

2. Size: As indicated on drawings.

2.03 GLAZING COMPOUNDS

A. Acrylic Sealant: ASTM C920, Type S, Grade NS, Class 12-1/2, Uses M and A; single component, solvent curing, non-bleeding; cured Shore A hardness of 15 to 25; clear color.

B. Silicone Sealant: ASTM C920, Type S, Grade NS, Class 25, Uses M and A; single component; chemical or solvent curing; non-bleeding, non-staining, cured Shore A hardness of 15 to 25; .

2.04 ACCESSORIES

A. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness.

B. Glazing Tape: Preformed butyl compound; 10 to 15 Shore A durometer hardness; on release paper.

C. Glazing Clips: Manufacturer's standard type.

D. Mirror Adhesive: Silicone pre-polymer based, chemically compatible with mirror coating and wall substrate.

1. Application Temperature: Minus 35 to 140 degrees F at contact surfaces.

2. Volatile Organic Content (VOC): Less than 7 percent by weight.

3. Manufacturers:

a. Liquid Nails, a brand of PPG Architectural Coatings: www.liquidnails.com/#sle.

E. Channel Frame: One piece, channel frame, stainless steel, Type 430, satin finish, CRL J-Channel with 90-degree mitered corners.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces of mirror frames or recesses are clean, free of obstructions, and ready for installation of mirrors.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous mirror frames or recesses with substrate compatible primer or sealer. Prime surfaces scheduled to receive sealant.

C. Prepare installation in accordance with ASTM C1193 for solvent release sealants, and install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Install mirrors in accordance with manufacturer's recommendations.

B. Set mirrors plumb and level, and free of optical distortion.

C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

D. Installation in Frames:

1. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.

2. Place setting blocks at one-quarter points with edge block no more than 6 inches from corners.

3. Rest mirrors on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.

4. Place glazing tape on free perimeter of mirrors in same manner described above.

5. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

6. Trim protruding tape edge.

3.04 CLEANING

A. Remove wet glazing materials from finish surfaces.

B. Remove labels after work is complete.

C. Clean mirrors and adjacent surfaces.

END OF SECTION

SECTION 09 05 61 - COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:

1. Resilient tile and sheet.
2. Broadloom carpet.
3. Carpet tile.
4. Thin-set ceramic tile and stone tile.
5. Fluid-Applied flooring.

B. Removal of existing floor coverings.

C. Preparation of new and existing concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Patching compound.

F. Remedial floor coatings.

G. Remedial floor sheet membrane.

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens) 2021.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete 2020.

C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2016a.

D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes 2019a.

E. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings 2011.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

A. CALGreen Submittals:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content.

B. Visual Observation Report: For existing floor coverings to be removed.

C. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:

1. Moisture and alkalinity (pH) limits and test methods.

2. Manufacturer's required bond/compatibility test procedure.

D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.

1. Manufacturer's qualification statement.

2. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.

3. Manufacturer's installation instructions.

4. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

E. Testing Agency's Report:

1. Description of areas tested; include floor plans and photographs if helpful.

2. Summary of conditions encountered.

3. Moisture and alkalinity (pH) test reports.

4. Copies of specified test methods.

5. Recommendations for remediation of unsatisfactory surfaces.

6. Product data for recommended remedial coating.

7. Submit report to Architect.

8. Submit report not more than two business days after conclusion of testing.

F. Adhesive Bond and Compatibility Test Report.

G. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.

H. Copy of RFCI (RWP).

1.06 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.

1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

D. Contractor's Responsibility Relating to Independent Agency Testing:

1. Provide access for and cooperate with testing agency.

2. Confirm date of start of testing at least 10 days prior to actual start.

3. Allow at least 4 business days on site for testing agency activities.

4. Achieve and maintain specified ambient conditions.

5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

E. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.

F. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.08 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sustainable Material Requirements: Adhesives, sealants, and caulks used on the project shall conform to the VOC limits listed in Division 01 section "Sustainable Design Requirements".

B. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:

1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to finish flush at edges.

2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.

3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

4. Products:

a. H.B. Fuller Construction Products, Inc; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.

C. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

D. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.

1. Thickness: As required for application and in accordance with manufacturer's installation instructions.

2. Products:

a. Allied Construction Technologies, Inc: www.actechperforms.com/#sle.

b. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.

c. Custom Building Products; TechMVC Moisture Vapor and Alkalinity Barrier: www.custombuildingproducts.com/#sle.

d. Floor Seal Technology, Inc; MES 100 with Floor Seal FloorCem SLU: www.floorseal.com/#sle.

e. Koster American Corporation; Koster VAP I 2000 with Koster SL Premium overlay: www.kosterusa.com/#sle.

f. LATICRETE International, Inc; LATICRETE NXT Vapor Reduction Coating with LATICRETE NXT Level Plus: www.laticrete.com/#sle.

g. LATICRETE International, Inc; LATICRETE SUPERCAP Moisture Vapor Control with LATICRETE SUPERCAP Underlayment: www.laticrete.com/#sle.

h. Maxxon Corporation; Aquafin SG2: www.maxxon.com/#sle.

i. Proflex Products, Inc; Moisture Barrier 25 with DPU - Deep Pour Underlayment: www.proflex.us/#sle.

j. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer and Sikafloor Self-Leveling Moisture Tolerant Resurfacer: www.sikafloorusa.com/#sle.

k. Stauf USA, LLC; ERP-270 Perma-Seal: www.staufusa.com/#sle.

l. Tnemec Company, Inc; Series 208 Epoxoprime MVT: www.tnemec.com/#sle.

m. UZIN UTZ NORTH AMERICA, INC; UZIN PE 460 with UZIN PE 280 and UZIN NC 170 LevelStar: https://us.uzin.com/#sle.

E. Remedial Floor Sheet Membrane: Pre-formed multi-ply sheet membrane installed over concrete subfloor and intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.

1. Thickness: 28 mil (0.028 inch).

2. Tape: Types recommended by underlayment manufacturer to install membrane and cover seams.

3. Products:

a. GCP Applied Technologies; Kovara MBX: www.gcpat.com/#sle.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:

1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:

   a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.

   b. Removal of existing floor covering.

2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:

   a. Do not attempt to remove coating or penetrating material.

   b. Do not abrade surface.

3. Preliminary cleaning.

4. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.

5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.

6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.

7. Specified remediation, if required.

8. Patching, smoothing, and leveling, as required.

9. Other preparation specified.

10. Adhesive bond and compatibility test.

11. Protection.

C. Remediations:

1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.

2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.

3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI (RWP), as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with recommendations of testing agency.

C. Comply with requirements and recommendations of floor covering manufacturer.

D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

E. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.10 APPLICATION OF REMEDIAL FLOOR TREATMENT

A. Comply with requirements and recommendations of treatment manufacturer.

3.11 INSTALLATION OF REMEDIAL FLOOR SHEET MEMBRANE

A. Install in accordance with sheet membrane manufacturer's instructions.

3.12 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Interior gypsum wallboard.

C. Gypsum backing board for wet areas and restrooms.

D. Joint treatment and surface coating.

E. Accessories.

1.02 RELATED REQUIREMENTS

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

B. Section 06 10 00 - Rough Carpentry: Building framing and structural sheathing, wood blocking.

C. Section 07 21 00 - Thermal Insulation.

D. Section 09 22 26.23 - Metal Suspension Systems (Armstrong Proprietary): Suspended drywall grid

1.03 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017 (Reapproved 2022).

B. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board 2004 (Reapproved 2020).

C. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing 2003 (Reapproved 2017).

D. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members 2018.

E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.

F. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.

G. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.

H. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2022.

I. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2022.

J. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base 2019.

K. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing 2017.

L. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel 2018.

M. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing 2018.

N. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.

O. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels 2019, with Editorial Revision (2020).

P. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2021.

Q. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

R. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

S. ASTM E413 - Classification for Rating Sound Insulation 2022.

T. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015, with Editorial Revision (2021).

U. GA-216 - Application and Finishing of Gypsum Panel Products 2021.

V. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association 2016.

1.04 SUBMITTALS

A. Refer to Division 01 for submittal procedures.

B. CALGreen Submittals: Provide product data for the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, include printed statement of VOC content.

C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

E. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing.

1.06 DELIVERY, STORAGE AND HANDLING

A. 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.

1.07 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 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, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.01 MATERIAL REQUIREMENTS, GENERAL

A. Refer to Division 01 for Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Adhesives and Sealants.

2.02 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

1. See PART 3 for finishing requirements.

2.03 BOARD MATERIALS - GENERAL

A. Manufacturers - Gypsum-Based Board:

1. CertainTeed Corporation: www.certainteed.com/#sle.

2. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
3. National Gypsum Company: www.nationalgypsum.com/#sle.
4. PABCO Gypsum: www.pabcogypsum.com/#sle.
5. USG Corporation: www.usg.com/#sle.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place. Long edges tapered, ends square cut.

1. Use Type X board, UL or WH listed.
2. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
3. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
    a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
5. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly.
6. Thickness:
    a. Vertical Surfaces: 5/8 inch.
    b. Ceilings: 5/8 inch.
    c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
7. Paper-Faced Products:
    a. CertainTeed Corporation; Type X Drywall: www.certainteed.com/#sle.
    b. Georgia-Pacific Gypsum; ToughRock Fireguard X: www.gpgypsum.com/#sle.
    c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.
    d. USG Corporation; Sheetrock Brand EcoSmart Panels Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
    e. USG Corporation; Sheetrock Brand Firecode X Panels 5/8 in. (15.9 mm): www.usg.com/#sle.
8. Mold Resistant Paper Faced Products:

a. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.

b. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: www.gpgypsum.com/#sle.

c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Gypsum Board: www.goldbondbuilding.com/#sle.

d. USG Corporation; Sheetrock Brand EcoSmart Panels Mold Tough Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.

9. Glass Mat Faced Products:

a. Georgia-Pacific Gypsum; DensArmor Plus Fireguard C Type X: www.gpgypsum.com/#sle.

b. National Gypsum Company; Gold Bond eXP Fire-Shield X Interior Extreme Gypsum Panel: www.nationalgypsum.com/#sle.

c. USG Corporation; USG Sheetrock Brand Glass-Mat Panels Mold Tough Firecode X.

2.04 BACKING BOARD FOR WET AREAS AND RESTROOMS

A. Application: Surfaces behind tile in wet areas including tub and shower surrounds, shower ceilings, and restrooms and janitorial closets.

B. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

C. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.

1. Fire-Resistance-Rated Type: Type X core, thickness 5/8 inch.

2. Products:

a. CertainTeed Corporation; GlasRoc 5/8" Type X Tile Backer: www.certainteed.com/#sle.

b. Georgia-Pacific Gypsum; DensShield Tile Backer: www.gpgypsum.com/#sle.

c. National Gypsum Company; Gold Bond eXP Tile Backer: www.nationalgypsum.com/#sle.

D. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

E. Fungal Resistance: No fungal growth when tested in accordance with ASTM G21.

F. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.

G. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.

H. Core Type: Regular and Type X, as indicated.

I. Type X Thickness: 5/8 inch.

J. Regular Board Thickness: 1/2 inch.

K. Edges: Square.

L. Glass Mat Faced Products:

1. CertainTeed Corporation; GlasRoc 1/2" Exterior Sheathing: www.certainteed.com/#sle.

2. CertainTeed Corporation; GlasRoc Type X Exterior Sheathing: www.certainteed.com/#sle.

3. Georgia-Pacific Gypsum; DensGlass Sheathing: www.gpgypsum.com/#sle.

4. Georgia-Pacific Gypsum; DensGlass Fireguard Sheathing: www.gpgypsum.com/#sle.

5. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Fire-Shield Sheathing: www.goldbondbuilding.com/#sle.

6. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing 1/2 in. (12.7 mm): www.usg.com/#sle.

7. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.

2.05 ACOUSTIC INSULATION

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: Full depth of studs.

B. Sound Isolation Tape: Elastomeric foam tape for sound decoupling.

1. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2. Tape Thickness: 1/4 inch.

3. Products:

a. Armacell LLC; ArmaComfort MTD: www.armacell.us/#sle.

C. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

1. Products:

a. Franklin International, Inc; Titebond GREENchoice Professional Acoustical Smoke and Sound Sealant: www.titebond.com/#sle.

b. Specified Technologies Inc; Smoke N Sound Acoustical Sealant: www.stifirestop.com/#sle.

2.06 ACCESSORIES

A. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.

1. Types: As detailed or required for finished appearance.

B. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.

1. Corner Beads: Low profile, for 90 degree outside corners.

2. Corner Beads: Low profile, for archways.

3. Architectural Reveal Beads:

a. Shapes: As indicated in the drawings.

4. Expansion Joints:

a. Type: Accordian profile with factory-installed protective tape.

b. Products:

1) Phillips Manufacturing Co; 093 Expansion Control Joint: www.phillipsmfg.com/#sle.

2) Trim-Tex, Inc: www.trim-tex.com/#sle.

3) USG Corporation; Type X.

5. 2-Piece Expansion Joints:

a. Type: Double J-molding with receiver and extended flange designed to provide a 1/2 inch reveal.

b. Products:

1) Phillips Manufacturing Co: www.phillipsmfg.com/#sle.

2) Trim-Tex, Inc: www.trim-tex.com/#sle.

3) USG Corporation; Type DX

C. Paper-Faced Beads, Joint Accessories, and Other Trim: ASTM C1047, unless noted otherwise.

1. Material: Paper-Faced Metal Drywall Bead and Trim. Paper tape laminated to a sturdy, rust-resistant metal form, Coated paper tape flange intended for adhesion by means of joint compound. No nailing is required.

    a. Manufacturer: USG Beadex® Brand Paper-Faced Metal Drywall Bead and Trim profiles.

    b. Or equal.

D. Moisture Guard Trim: ASTM C1047, rigid plastic, 48 inch length, applied to bottom edge of gypsum board.

1. Height: 1/2 inch.

2. Depth: To match board thickness.

3. Products:

    a. Waterguard USA; Waterguard: www.waterguard-usa.com/#sle.

2.07 JOINT AND SURFACE FINISHES

A. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.

2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.

3. Joint Compound: Drying type, vinyl-based, ready-mixed.

B. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

1. Products:

    a. CertainTeed Corporation; Level V Wall and Ceiling Primer/Surfacer with M2Tech: www.certainteed.com/#sle.

    b. USG Corporation; USG Sheetrock Brand Tuff-Hide Primer-Surfacer: www.usg.com/#sle.

2.08 FASTENERS AND ADHESIVES

A. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

B. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

C. Nails for Attachment to Wood Members: ASTM C514.

D. Adhesive for Attachment to Wood, ASTM C557:

1. Products:

a. Franklin International, Inc; Titebond PROvantage Professional Drywall Adhesive: www.titebond.com/#sle.

b. Liquid Nails, a brand of PPG Architectural Coatings: www.liquidnails.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 GENERAL FRAMING INSTALLATION

A. Studs: Space studs at 16-inches on-center unless otherwise indicated.

1. Extend partition framing to structure where indicated and to ceiling in other locations.

2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

B. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

C. Blocking: Install for support of:

1. Framed openings.

2. Wall-mounted cabinets.

3. Plumbing fixtures.

4. Toilet partitions.

5. Toilet accessories.

6. Wall-mounted door hardware.

7. Hangers: 48 inches o.c.

8. Carrying Channels (Main Runners): 48 inches o.c.

9. Furring Channels (Furring Members): 16 inches o.c.

3.03 ACOUSTIC ASSEMBLIES

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.

C. Acoustic Sealant: Install in accordance with manufacturer's instructions.

1. Place two beads continuously on substrate before installation of perimeter framing members.

2. Place continuous bead at perimeter of each layer of gypsum board.

3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board perpendicular to framing, with ends and edges occurring over firm bearing.

C. Double-Layer, Nonrated: Construct assemblies using product types specified for applications indicated on the drawings. Place first layer parallel to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

D. Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

E. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For nonrated assemblies, install as follows:

1. Single-Layer Applications: Adhesive application.

2. Double-Layer Application: Install base layer using screws or nails. Install face layer using adhesive.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

2. At exterior soffits, not more than 30 feet apart in both directions.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

D. Decorative Trim: Install at locations shown on drawings and in accordance with manufacturer's instructions.

E. Moisture Guard Trim: Install on bottom edge of gypsum board according to manufacturer's instructions and in locations indicated on drawings.

3.06 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.

C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.

2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

3. Level 3: Walls to receive textured wall finish.

4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.

5. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.

6. Level 0: Temporary partitions.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch.

2. Taping, filling, and sanding is not required at surfaces behind fixed cabinetry.

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

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SECTION 09 22 26.23 - METAL SUSPENSION SYSTEMS (ARMSTRONG PROPRIETARY)

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Suspension System Framing and Furring for flat or curved Plaster and Gypsum Board Ceiling and Soffit Assemblies

2. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

3. Transition moldings, shared pockets, and fascia systems.

1.02 RELATED SECTIONS

A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

B. Section 09 21 16 - Gypsum Board Assemblies - Gypsum Board

C. Division 23 Sections - Mechanical Work

D. Division 26 Sections - Electrical Work

1.03 REFERENCES

A. ASTM A641/A641M Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire.

B. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability"

D. ASTM D 610 Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces

E. ASTM B 117 Standard Practice for Operating Salt Spray (Fog) Apparatus

F. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

G. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

H. ASTM C 1858 Standard Practice for Design, Construction, and Material Requirements for Direct Hung Suspended T-bar Type Ceiling Systems Intended to Receive Gypsum Panel Products in Areas Subject to Earthquake Ground Motions

I. ASTM C 645 Standard Specification for Nonstructural Steel Framing Members

J. ASTM C 754 Installation of Steel Framing Members to Receive Screw-Attached Gypsum Board

K. ASTM C1002 Standard Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.

L. ASTM E 119 Standard Test Method for Fire Tests of Building Construction and Material (if applicable).

M. ESR-1289 ICC-ES Evaluation Report.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's technical literature, specifications, and installation instructions with Project conditions and materials clearly identified for each required system.

B. Shop Drawings: Submit reflected ceiling plans drawn to scale. Include coordinated penetrations and ceiling-mounted items. Include any necessary details or drawings from the manufacturer regarding recommended installation.

C. Samples: 8-inch-long samples of suspension system components, including main runner, cross tees and angle molding.

D. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.

1.05 QUALITY ASSURANCE

A. Single-Source Responsibility: To ensure proper interface, all drywall furring components shall be produced or supplied by a single manufacturer.

B. All accessory components from other manufacturers shall conform to ASTM standards.

C. Installer qualifications: Must be experienced in the installation of systems similar to those specified herein.

D. Fire Resistance Ratings: As indicated by reference to design designations in UL Fire Resistance Directory, for types of assemblies in which drywall ceilings function as a fire protective membrane and tested per ASTM E 119. Installation in accordance with the UL Design being referenced.

1.06 COORDINATION

A. Coordinate drywall furring work with installers of related work including, but not limited to acoustical ceilings, building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

B. All work above the ceiling line should be completed prior to installing the drywall sheet goods. There should be no materials resting against or wrapped around the suspension system, hanger wires or ties.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

1.08 WARRANTY

A. Suspensions System: Submit a written limited warranty executed by the manufacturer, agreeing to repair or replace grid components that are supplied with a hot-dipped galvanized coating or aluminum base material. Failures include but are not limited to: The occurrence of 50% red rust as defined by ASTM D 610 test procedures as a result of defects in materials or factory workmanship.

B. Warranty Period: Grid: Ten years from date of installation.

C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.09 EXTRA MATERIALS

A. Provide extra materials in the manufacturer's unopened packaging, with the manufacturer’s label intact: Suspension System Components - minimum 5% of each type installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Suspension Systems: Armstrong World Industries, Inc.

2.02 SUSPENSION SYSTEMS

A. Main Beam: Shall be double-web construction (minimum 0.0179 inch prior to protective coating, ASTM C645), hot dipped galvanized (per ASTM A653/A653M).

1. HD8906HRC: 1-11/16 inch web height, 1-1/2 inch flange, available with G40 or hot dipped galvanization. (61% Recycle content, 53% Post Consumer, 8& Pre-Consumer).

B. Primary Cross Tees: Shall be double-web steel construction (minimum 0.0179 inch prior to protective coating, ASTM C645), hot dipped galvanized (minimum G40 or G90 perASTM A653/A653M)

1. XL8945PHRC: 48 inch, web height 1-1/2 inch with rectangular bulb and pre-finished 1-1/2 inch knurled flange. (61% Recycle content, 53% Post Consumer, 8& Pre-Consumer).

C. QuikStix Soffits DGS: Shall be double web steel construction (minimum 0.0179 inch prior to protective coating, ASTM C645), Tees designed for creating soffits; 1-1/2 inch web height.

1-1/2 inch flange, flattened bulb, bending crimp, knockouts and alignment holes to facilitate creating 15, 30, 45, 60 and 90 degree angles; available with G40 or G90 hot dipped galvanization.

1. QS612: 12 foot tee with knockouts 6 inches on center, route holes 6 inches on center.

D. Wall Molding:

1. LAM-12HRC: 12 foot Locking Angle Molding, 1-1/4 inch x 1-1/4 inch with pre-engineered locking tabs punched 8 inches on center, knurled surface, screw stop hem, pre-punched holes in top flange, 4" O.C., .018 mil. 25g. (61% Recycle content, 53% Post Consumer, 8& Pre-Consumer).

2. KAM -12HRC: 12 foot Knurled Angle molding, 1-1/4 inch x 1-1/4 inch, knurled surface, screw stop hem, pre-punched holes in top flange, 4" O.C., .018 mil. 25g. (61% Recycle content, 53% Post Consumer, 8& Pre-Consumer).

E. Transition Molding: Drywall to Acoustical ceiling.

1. Pre-Painted Armstrong Global White integral acoustical flange and drywall taping flange, hot dipped cold rolled steel.

a. 7901: 120 inch with 3/8 inch reveal and 9/16 inch acoustical flange.

F. Support Hanger

1. SB12P: Strong Back Support Hanger

G. Screws for wallboard application shall be bugle head screws in accordance with thickness of material used.

H. Metal Trim or Plastic Members (by Others)

1. Corner bead: Minimum #26 gauge, zinc alloy of plastic square edge type with expanded flanges.

2. Casing Bead: Minimum #24 gauge, zinc alloy or plastic square edge type with expanded flanges.

3. Control Joints: Minimum #26 gauge, roll-formed zinc alloy, extruded aluminum or plastic with expanded flanges.

4. Special Trim Shapes: As detailed on plans, extruded aluminum with acrylic coating by Fry Reglet or approved equal.

2.03 STRUCTURAL CLASSIFICATION

A. Main Beam shall be heavy duty per ASTM C 635.

B. Classification can require wires to be closer together for additional loading when used to support double layer gypsum, verticals, slopes, domes, half barrels, circles, soffits, canopies, and step conditions which call for loading or unusual designs and shapes in

drywall construction. Using cross tees in the construction of circles, barrels, etc. is common in order to hold the radius.

C. Deflection of fastening suspension system supporting light fixtures, ceiling grilles, access doors, verticals and horizontal loads shall have a maximum deflection of 1/360 of the span.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Install suspension system and panels in accordance with the manufacturer's instructions, in compliance with ASTM installation standard, and with applicable codes as required by the authorities having jurisdiction.

B. Install hanger wire as required with necessary on center spacing to support expected ceiling load requirements, following local practices, codes and regulations. Provide additional wires at light fixtures, grilles, and access doors where necessary. A pigtail knot shall be used with three tight wraps at top and bottom fastening locations.

C. Add additional wire as needed when using compatible clips and accessories.

D. Control Joints: Roll formed zinc alloy, aluminum, or plastic as required for expansion and contraction as shown on drawings.

E. Expansion Joints: Roll formed zinc alloy, aluminum, or plastic as required for expansion and contraction as shown on drawings.

F. Main beams shall be suspended from the overhead construction with hanger wire, spaced as required for expected ceiling loads, along the length of the main beams.

G. Install cross tees at on center spacing as specified by the drywall manufacturer. Typical drywall cross tee spacing:

1. 16 inches on center with 5/8 or 1/2 inch gypsum board

2. 24 inches on center with 5/8 inch gypsum board

H. Other items such as wood, sheet metal, or plastic panels should be screwed to comply with deflection limit equivalent to that of the ceiling installation.

I. Use channel molding or angle molding to interface with Drywall Grid System to provide perimeter attachment or to obtain drop soffits, verticals, slopes, etc.

J. For light fixtures (Type G, Type F) use secondary framing cross tees as required to frame opening.

K. Single cross tees in a route hole to be secured by 7/16 inch framing screw or alternative methods.

3.02 INSTALLATION - INTERIOR APPLICATIONS

A. Install main beams and cross tees at the on center spacing required for ceiling loading, and location of in-ceiling services.

B. Additional bracing as required by code.

END OF SECTION

SECTION 09 24 00 - CEMENT PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Lath.

B. Cement plastering.

C. Finish system.

D. Water Resistive Barrier: Provided as part of the cement plaster assembly. Integrated and lapped into existing WRB.

1.02 RELATED REQUIREMENTS

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

B. Section 07 62 00 - Sheet Metal Flashing and Trim

C. Section 07 92 00 - Joint Sealants

D. Section 09 21 16 - Gypsum Board Assemblies: Glass mat faced gypsum sheathing.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.

B. AISI S200 - North American Standard for Cold-Formed Steel Framing - General Provisions 2012.

C. APA E30 - Engineered Wood Construction Guide 2019.

D. ASTM C297/C297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions 2016.

E. ASTM C847 - Standard Specification for Metal Lath 2018.

F. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster 2021.

G. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing 2017.

H. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing 2017 (Reapproved 2023).

I. ASTM C933 - Standard Specification for Welded Wire Lath 2018.

J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

K. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022a, with Editorial Revision (2023).

L. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2022.

M. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials 2021a.

N. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies 2023a.

O. ASTM G154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials 2023.

P. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Q. ICC (IRC) - International Residential Code for One- and Two-Family Dwellings Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

R. ISO 9001 - Quality Management Systems — Requirements 2015.

S. ISO 14001 - Environmental Management Systems — Requirements with Guidance for Use 2015.

T. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components 2023.

U. SCAQMD 1113 - Architectural Coatings 1977, with Amendment (2016).

V. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 DESIGN REQUIREMENTS

A. Structural (wind and axial loads): Provide completed assemblies with the following characteristics:

1. Design for maximum allowable deflection of vertical assemblies, normal to the plane of the wall, of L/360 under lateral point load of 100 lbs.

2. Design for maximum allowable deflection of horizontal assemblies of L/240 under dead loads and wind uplift.

3. Design for wind load in conformance with building code requirements.

4. Refer to applicable ICC ESR for wind load limitations that may apply.

B. Moisture Control

1. Prevent the accumulation of water into or behind the cement plaster, either by condensation or leakage into the wall construction:

2. Air Leakage Prevention – prevent excess air leakage. Provide continuity between air barrier components in the wall assembly.

3. Vapor Diffusion and Condensation – perform a dew point analysis and/or dynamic hygrothermal modeling of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust wall assembly components accordingly to minimize the risk of condensation.

4. Provide Air/Moisture Barrier over sheathing, concrete and masonry.

5. Provide Water Resistive Barrier over Air/Moisture Barrier.

C. Fire Protection

1. Provide components complying with requirements for fire rated assemblies where indicated on the drawings.

2. Noncombustible Type Construction: Provide full width firestops at floor lines, typically 4 pcf semi-rigid mineral wool, where metal framing runs continuously past floor line and provide minimum 3/4 inch uniform cement plaster thickness.

3. Fire Resistance Rated Non-load Bearing Wall Assembly: provide 7/8 inch uniform cement plaster thickness. Refer to plaster manufacturer's published documentation for a one hour rated non-load bearing fire-resistive rated wall assembly.

1.05 PERFORMANCE REQUIREMENTS

A. Air/Moisture Barrier: Compliant with ICC ES Acceptance Criteria AC 212 (Basis of Design StoPowerwall: ICC ESR 1233)

1. Material Air Leakage Resistance, ASTM E2178: less than 0.004 cfm/ft^2 at 1.57 psf.

2. Assembly Air Leakage Resistance, ASTM E2357: less than 0.04 cfm/ft^2 at 1.57 psf.

3. Water Vapor Permeance, ASTM E96/E96M, Method B: greater than 10 perms.

4. Surface Burning, ASTM E84: Flame Spread less than 25, Smoke Developed less than 450, Class A Building Material

5. Tensile Adhesion, ASTM C297/C297M:

a. Gypsum Sheathing, exceeds strength of substrate

b. Plywood, > 85 psi

c. OSB, > 30 psi

6. VOC Limits:

    a. Less than 100 g/L

    b. Compliant with US EPA 40 CFR 59, Subpart D for waterproofing/sealer

    c. Compliant with SCAQMD 1113 for waterproofing/sealer

B. Cement Plaster Base

1. Stucco scratch and brown coat material in compliance with ASTM C926.

C. Primer

1. Acrylic Primer for fully cured (minimum 28 day old or pH less than 10) cement plaster surfaces:

2. Surface Burning, ASTM E84: Flame Spread less than 25, Smoke Developed less than 450, Class A building material.

3. VOC: less than 50 g/L, compliant with SCAQMD 1113 for architectural coatings

D. Flexible Acrylic Finish

1. Accelerated Weathering, ASTM G154: 2000 hours, no blistering, checking cracking, crazing, or other deleterious effects.

2. Water Vapor Permeability, ASTM E96/E96M, Method B: 12 perms

3. Surface Burning, ASTM E84: Flame Spread less than 25, Smoke Developed less than 450, Class A building material.

4. VOC: less than 50 g/L, compliant with SCAQMD 1113 for architectural coatings

1.06 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.

B. Product Data: Provide data on plaster materials and trim accessories.

1. Structural characteristics, material limitations, and finish for furring and lathing components.

2. Manufacturer’s code compliance report for air barrier and water-resistive barrier

3. Manufacturer’s NFPA 285 assembly report or ICC ESR indicating compliance of air/moisture barrier with requirements of NFPA 285 for use on Types I, II, III, and IV construction.

4. Fastener manufacturer’s pull-out or withdrawal capacity testing for frame and solid substrates

C. Evaluation Service Reports: Show compliance with specified requirements.

D. Installer's Qualification Statement.

E. Sample warranty.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications

1. Cement plaster and air barrier products manufacturer for a minimum of twenty (20) years.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with manufacturer's published specifications and details and the project plans and specifications.

C. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.08 FIELD CONDITIONS

A. Maintain ambient and surface temperatures above 40°F during application and for 24 hours after set of cement plaster, and after application of air/moisture barrier and finish materials.

B. Provide supplementary heat for installation in temperatures less than 40°F such that material temperatures are maintained. Prevent concentration of heat on uncured cement plaster and vent fumes and other products of combustion to the outside to prevent contact with cement plaster.

C. Prevent uneven or excessive evaporation of moisture from cement plaster during hot, dry or windy weather. For installation under any of these conditions provide special measures to properly moist cure the cement plaster. Do not install cement plaster if ambient temperatures are expected to rise above 100ºF within a 24-hour period.

D. Provide protection of surrounding areas and adjacent surfaces from application of materials.

E. Commence the cement plaster installation after completion of all floor, roof construction and other construction that imposes dead loads on the walls to prevent excessive deflection and potential cracking of the cement plaster.

F. Sequence interior work such as drywall installation prior to cement plaster installation to prevent stud distortion and potential cracking of the cement plaster.

1.09 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials in their original sealed containers bearing the manufacturer’s name and identification of product.

B. Handle all products as directed on labeling.

C. Protect coatings (pail products) from freezing and temperatures in excess of 90°F. Store away from direct sunlight.

D. Protect portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

1.10 WARRANTY

A. Provide manufacturer's standard 7-year material warranty for the system.

B. Provide manufacturer's optional 10-year material warranty for the system when levelling coat is provided.

PART 2 PRODUCTS

2.01 GENERAL PRODUCT REQUIREMENTS

A. Cement plaster finish products and air barrier products manufactured under ISO 9001 Quality System and ISO 14001 Environmental Management System.

2.02 AIR/MOISTURE BARRIER

A. Manufacturer: Basis of Design: Sto EmeraldCoat and compatible components.

2.03 WATER-RESISTIVE BARRIER

A. Minimum No. 15 asphalt saturated felt complying with ASTM D226/D226M, Type 1, or one layer of Grade D kraft building paper, or paper-backed cement plaster lath.

2.04 LATH

A. Manufacturers: Metal Lath and Accessories:

1. Alabama Metal Industries Corporation; Self-Furred Diamond Mesh Lath: www.amico-lath.com/#sle.

2. CEMCO: www.cemcosteel.com/#sle.

3. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com/#sle.

4. Phillips Manufacturing Co; Paperback Lath: www.phillipsmfg.com/#sle.

5. Semco Southeastern Metals; www.semetals.com/#sle.

6. Structa Wire Corporation; Structa Mega Lath: www.structawire.com/#sle.

B. Diamond Mesh Metal Lath: ASTM C847, galvanized; self-furring.

1. Weight: To suit application and as specified in ASTM C841 or ASTM C1063 for framing spacing.

2. Weight: 2.5 lb/sq yd.

3. Backed with treated paper.

C. Ribbed Metal Lath: ASTM C847, galvanized; 3/8 inch thick.

1. Weight: To suit application and as specified in ASTM C841 or ASTM C1063 for framing spacing.

2. Weight: 3.4 lb/sq yd.

3. Backed with treated paper.

D. Corner Mesh: Formed sheet steel, minimum 0.018 inch thick, perforated flanges shaped to permit complete embedding in plaster, minimum 2 inch size; same finish as lath.

E. Strip Mesh: Expanded metal lath, same weight as lath, 2 inch wide by 24 inch long; same finish as lath.

F. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, and maximum possible lengths.

G. Material: Formed sheet steel with rust inhibitive primer, expanded metal flanges.

H. Casing Beads with Weep Holes: Square edges.

1. Alabama Metal Industries Corporation; E-Z Bead: www.amicoglobal.com/#sle.

2. CEMCO: www.cemcosteel.com/#sle.

3. Phillips Manufacturing Co; #66 Expanded Flange Square Casing Bead: www.phillipsmfg.com/#sle.

I. Corner Beads: Bullnosed corners.

1. Phillips Manufacturing Co; #1 Expanded Corner Bead: www.phillipsmfg.com/#sle.

J. Expansion Joints: Accordion profile with factory-installed protective tape, 2-inch-wide flanges.

1. Phillips Manufacturing Co; #15 Double V Expansion Joint: www.phillipsmfg.com/#sle.

K. Base Screeds: Beveled edges.

L. Control Joints: Accordion profile with factory-installed protective tape, 2-inch flanges.

2.05 CEMENT PLASTER APPLICATIONS

A. Lath Plaster Base: Metal lath.

B. Cement Plaster thickness shall be a uniform 3/4 inch or 7/8 inch. Cement plaster thickness shall not exceed 7/8 inch. Thickness shall be uniform throughout the wall area and otherwise match existing and adjacent applications.

1. Plaster Type: Factory prepared plaster mix.

2. Number of Coats: Three.

3. First Coat: Apply to a nominal thickness of 3/8 inch.

4. Second Coat: Apply to a nominal thickness of 3/8 inch.

5. Leveling Coat: Apply to a nominal thickness of 1/32 to 1/16 inch.

6. Finish Coat: Apply to a nominal thickness of 1/8 inch.

a. Texture: to match existing.

7. Finish: Acrylic.

2.06 FACTORY PREPARED CEMENT PLASTER

A. Exterior Portland cement plaster system made of scratch and brown base coat, leveling coat, and acrylic finish coat; install in accordance with ASTM C926.

1. Provide Air/Moisture barrier as part of the system.

2. Provide Water Resistive barrier as part of the system.

3. Manufacturer - Basis of Design:

a. Sto Corp; Sto Powerwall: www.stocorp.com/#sle.

4. Other Acceptable Manufacturers:

a. LaHabra; FastWall 300: www.lahabracement plaster.com/#sle.

b. Master Builders Solutions; Senergy Platinum CI Stucco Ultra: www.master-builders-solutions.com/en-us/#sle.

c. Parex USA, Inc; Armourwall 300: www.parexusa.com/#sle.

B. Premixed Base Coats: Mixture of cement, aggregate, fibers, and proprietary admixtures for scratch and brown coats; install in accordance with ASTM C926.

1. Basis of Design:

a. 108 StoPowerwall Scratch & Brown: portland cement-based cement plaster concentrate.

C. Premixed Leveling Coat: Acrylic polymer-based blend approved for use with plaster manufacturer's base coat and finish materials.

D. Primer: Acrylic, as recommended by coating manufacturer and compatible with plaster base coat.

1. Basis of Design:

a. StoPrime - acrylic based tinted primer for fully cured (minimum 28 day old or pH less than 10) cement plaster surfaces.

b. Where pH is greater than 10, provide Sto Prime Sand or Sto Prime Hot.

E. Premixed Finish Coating: Integrally colored, acrylic coating.

1. Color: As indicated on drawings.

2. Basis of Design:

a. StoPowerwall Finish – integrally colored, factory blended, flexible acrylic textured wall finish with graded marble aggregate.

2.07 ACCESSORIES

A. Tie Wire: Annealed galvanized steel.

B. Mechanical Fasteners: Non-corroding fasteners in compliance with AISI S200:

1. Wood Framing - minimum 11-gauge, 7/16 inch diameter head galvanized roofing nails with minimum 3/4 inch penetration into studs or minimum #8 Type S wafer head fully threaded corrosion resistant screws with minimum 3/4 inch penetration into studs.

2. Steel Framing – minimum #8 Type S or S-12 wafer head fully threaded corrosion resistant screws with minimum 3/8 inch and three thread penetration into studs.

3. Concrete or Masonry – minimum # 8 wafer head fully threaded corrosion resistant screws for masonry with minimum 1 inch penetration into substrate.

C. Reinforcing Mesh: 4.5 oz/sq yd alkali-resistant mesh.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting this work. Inspect surfaces for:

1. Contamination: Record areas where algae, chalkiness, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances are observed.

2. Surface absorption and chalkiness: Record areas where observed.

3. Cracking: Measure crack width and record location of cracks.

4. Damage and deterioration: Record areas where observed.

5. Moisture damage: Record any areas of moisture damage.

B. Verify masonry joints are flush and surfaces are ready to receive work of this section, and that there are no existing bituminous or water repellent coatings on masonry surfaces.

C. Verify concrete surfaces are flat, honeycombs are filled flush, and surfaces are ready to receive work of this section, and that there are no existing bituminous, water repellent, or form release agent coatings on concrete surfaces that may be detrimental to plaster bond.

D. Proof test adhesion to prepared poured-in-place or pre-cast concrete surfaces and impose a regimen of quality control tests to verify adhesion throughout the project.

E. Inspect sheathing application for compliance with applicable requirement:

1. Glass Mat Faced Gypsum Sheathing in compliance with ASTM C1177/C1177M – refer to manufacturer’s instructions and/or ICC evaluation report

2. Exterior Grade and Exposure 1 wood based sheathing – APA Engineered Wood Association APA E30

F. Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are properly in place.

G. Verify mechanical and electrical equipment and services located within areas to receive this work have been properly tested and approved.

H. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air/moisture barrier or cement plaster installation to the General Contractor. Do not proceed with air/moisture barrier or cement plaster installation until deviations are corrected.

3.02 PREPARATION

A. Sheathing

1. Remove surface contaminants and replace damaged sheathing.

2. Where gaps exceed 1/8 inch in width, use plaster manufacturer's approved compound to fill joints, or apply low expanding urethane foam into joints and rasp or shave flush with sheathing surface in preparation for installation of joint treatment.

3. Spot surface defects in sheathing with plaster manufacturer's approved joint treatment.

3.03 INSTALLATION - AIR/MOISTURE BARRIER

A. Apply Air/Moisture Barrier to all substrates including concrete, masonry, wood sheathing, and glass mat faced gypsum sheathing.

B. Transition Detailing: Detail transition areas including static joints and seams, and dynamic joints and seams to achieve air barrier continuity in conformance with manufacturer's published guidelines.

C. Rough Opening Protection:

1. Framed openings: Apply 9 inch wide mesh at rough openings. Immediately apply filler material by spray or trowel over the mesh and spread with a trowel to create a smooth surface that completely covers the mesh.

2. Concrete and masonry openings with wood bucks: Apply a fillet bead of filler material at interior corners inside the opening to seal jamb/sill and jamb/head seams. Apply material along sill, jambs, and head to form a generous bead of material along the surface to be covered. Spread the material to a uniform minimum thickness of 12-20 mils before the material skins. Treat the entire rough opening surface in this manner and overlap onto the face of the sheathing 2 inches minimum all the way around.

D. Sheathing Joint Treatment: Place 4-inch-wide mesh centered along sheathing joints and minimum 9 inch wide mesh centered and folded at inside and outside corners. Immediately apply filler material by spray or trowel and spread with a trowel to create a smooth surface that completely covers the mesh.

E. Air/Moisture Barrier Coating Installation

1. Plywood and Gypsum Sheathing: apply waterproof coating by spray or roller over sheathing surface, including the dry joint treatment, rough opening protection, and transition areas, to a uniform wet mil thickness of 10 wet mils in one coat.

2. OSB Sheathing: apply waterproof coating by spray or with a 3/4 inch nap roller to sheathing surface to a uniform wet mil thickness of 10 wet mils. Allow to dry, inspect surface for raised wood stands, and touch up these areas with a second coat.

3. CMU Surfaces:

a. Repair static cracks up to 1/2 inch wide with manufacturer's recommended filler material. Protect repair from weather until dry.

b. Apply coating to the surface by roller or spray to a wet thickness of 10-30 mils, depending on surface condition. Apply to a uniform thickness. Additional coats may be necessary to provide a void and pinhole free surface. Protect from weather until dry.

F. Air /Moisture Barrier Connections and Shingle Laps

1. Coordinate installation of connecting air barrier components with other trades to provide a continuous airtight membrane.

2. Coordinate installation of flashing and other moisture protection components with other trades to achieve complete moisture protection such that water is directed to the exterior, not into the wall assembly, and drained to the exterior at sources of leaks (windows, doors and similar penetrations through the wall assembly).

3. Splice-in head flashings above windows, doors, floor lines, roof/sidewall step flashing, and similar locations with detail component to achieve shingle lap of the air/moisture barrier such that water is directed to the exterior.

G. Do not allow Air/Moisture Barrier to remain exposed for more than 180 days. Protect with cement plaster system promptly after installation.

3.04 INSTALLATION - WATER-RESISTIVE BARRIER

A. Install two layers of water-resistive barrier in accordance with water-resistive barrier manufacturer's instructions.

B. Integrate water-resistive barrier with flashing accessories, and adjacent doors, windows, penetrations, and cladding transitions.

C. Apply water-resistive barrier horizontally with upper layer lapped over lower layer at least 2 inches.

D. Lap water-resistive barrier at least 6 inches at vertical joints.

E. Lap water-resistive barrier at least 16 inches beyond vertical line of inside and outside corners in both directions.

F. For two layer applications, start with two horizontal layers at bottom of exterior wall or structure.

3.05 INSTALLATION - LATHING AND ACCESSORIES

A. Install lath and furring for fire-rated assemblies in accordance with requirements of assembly as indicated.

B. Install metal lath and furring for cement plaster in accordance with ASTM C1063.

1. Install full accessory pieces where possible and avoid small pieces. Seal adjoining pieces by embedding ends in sealant. Abut horizontal into vertical joint accessories, except where horizontal movement joints exist that prevent continuous vertical runs of accessories. Attach at no more than 7 inches on center into solid substrate/framing with appropriate fasteners.

2. Install foundation weep screed at the base of the wall securely to solid substrate or framing with the appropriate fastener. Locate foundation weep screed so that it overlaps the joint between the foundation and framing by a minimum of 1 inch. Locate the foundation weep screed nosing minimum 4 inches above earth grade, 2 inches above paved surfaces. Lap waterproof air barrier, sheet water-resistive barrier, **[and drainage mat]** over the weep screed attachment flange.

3. Install casing beads at cement plaster terminations – doors, windows and other through wall penetrations.

4. Install corner lath at inside corners and corner bead at outside corners over lath. Attach through lath into solid substrate or framing at no more than 7 inches on center with appropriate fasteners.

5. Place additional strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

C. Control and Expansion Joint Installation

1. Locate control and expansion joints in compliance as shown on drawings and in conformance with ASTM C1063:

   a. Area of plaster panel not to exceed 144 sq ft for vertical surfaces.

   b. Area of plaster panel not to exceed 100 sq ft for horizontal, curved or angled surfaces.

   c. Spacing between control joints not to exceed 18 ft in each direction.

   d. Area bounded by control joints not to exceed a length-to-width ratio of 2-1/2 to 1.

2. Two-piece expansion joints: Install two-piece joints at building expansion joints; through-wall joints in concrete or CMU; where cement plaster is to be installed over dissimilar construction or substrates; at changes in building height; at floor lines, columns, and cantilevered areas.

3. One-piece expansion joints: Install one-piece above and below doors and windows. Wire tie one piece expansion joints to lath at no more than 7 inches on center. Seal adjoining pieces by embedding ends in sealant. Lath shall be discontinuous at or beneath joints.

D. Access Panel Installation

1. Install access panels and rigidly secure in place.

2. Install frames plumb and level in opening. Secure rigidly in place.

3. Position to provide convenient access to concealed work requiring access.

E. Lath Installation

1. Diamond Mesh Metal Lath – conform to ASTM C1063

   a. General – install metal lath horizontally on solid substrates with the long dimension at right angles to structural framing. Terminate lath at expansion joints. Do not install continuously at joints.

   b. Seams/Overlaps--overlap side seams minimum 1/2 inch and end seams minimum 1 inch. Stagger end seams. Overlap casing beads and expansion joints minimum 1 inch over narrow wing accessories, minimum 2 inches over expanded flange accessories. Do not install lath continuously beneath expansion joints.

c. Attachment--fasten securely into solid substrates or through sheathing into structural framing at 7 inches on center maximum vertically and 16 inches on center horizontally. Wire tie at no more than 9 inches on center at: side laps, accessory overlaps, and where end laps occur between supports.

2. Paper-backed lath – follow installation as for diamond mesh metal lath. Lap lath over lath, not paper to lath overlap. For horizontal overlaps the paper backing must lap shingle style behind the lath-to-lath overlap.

3.06 MIXING

A. Mix only as much plaster as can be used prior to initial set.

B. Mix materials dry, to uniform color and consistency, before adding water.

C. Add air entrainment admixtures to each coat to provide 5 to 7 percent air entrainment.

D. Do not retemper mixes after the initial set has occurred.

E. Protect mixtures from frost or freezing temperatures, contamination, and excessive evaporation.

3.07 INSTALLATION - CEMENT PLASTER

A. Apply cement plaster in discrete panels without interruption to avoid cold joints and differences in appearance. Abut wet cement plaster to set cement plaster at natural or architectural breaks in the wall such as expansion joints, pilasters, terminations, or changes in plane.

B. The finished installation must be true, plumb and square.

C. Follow plaster system manufacturer's recommendations for procedures when temperature and humidity are hot, dry, cold, or windy. Adjust scheduling and curing to prevent damage. Do not install cement plaster during extremely hot, dry and/or windy conditions. Do not install cement plaster during freezing conditions or on frozen substrates.

D. Do not install cement plaster onto grounds of accessories. Should cement plaster get into control or expansion joints, remove the cement plaster from within the joint before the cement plaster sets.

E. Completely embed lath and flanges of accessories and completely cover fastener attachments with cement plaster.

F. Moist cure cement plaster minimum 48 hours for optimum strength gain and resistance to cracking.

G. Allow final cement plaster application to completely dry (28 days) before applying primer or finish.

3.08 APPLICATION

A. Apply plaster in accordance with manufacturer's written instructions and comply with ASTM C926.

B. Base Coats:

1. Apply base coats to fully embed lath and to specified thickness.

2. Follow guidelines in ASTM C926 and manufacturer's written installation instructions for moist curing base coats and application of subsequent coats.

C. Leveling Coat:

1. Apply leveling coat to specified thickness.

2. Fully embed reinforcing mesh in leveling coat.

D. Finish Coats:

1. Cement Plaster:

a. Apply with sufficient material and pressure to ensure complete coverage of base to specified thickness.

b. Apply desired surface texture while mix is still workable.

c. Float to a consistent finish.

3.09 CURING AND SURFACE PREPARATION

A. Moist cure cement plaster for a minimum of 48 hours.

B. Wait until cement plaster is 28 days old or the pH level of the surface is below 10 before applying primer. Final age of primed cement plaster application must be minimum 28 days before application of finish or pH must be below 10.

C. Remove surface contaminants such as dust and dirt without damaging substrate.

3.10 PRIMER AND ACRYLIC COATING

A. Do not apply finish over irregular or unprepared surfaces or surfaces not in compliance with the requirements of the project specifications.

B. Follow plaster system manufacturer's recommendations for procedures when temperature and humidity are hot, dry, cold, or windy. Adjust scheduling and curing to prevent damage and take added measures of protection against wind, dust, dirt, rain and freezing when recommended by the system manufacturer.

C. Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.

D. Apply primer in accordance with manufacturer's instructions.

E. Textured Finish Application:

1. Apply finish coating in number of coats and to thickness recommended by manufacturer.

2. Avoid application in direct sunlight.

3. Apply finish in a continuous application, and work a wet edge towards the unfinished wall area. Work to an architectural break in the wall before stopping to avoid cold joints.

3.11 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

3.12 REPAIR

A. Patching: Remove loose, damaged, or defective plaster and replace with plaster of same composition; finish to match surrounding area.

END OF SECTION

SECTION 09 30 00 - TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

1.02 RELATED REQUIREMENTS

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

B. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

D. Division 22: Plumbing systems and fixtures

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium) 2019.

B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar 2017.

C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 2017.

D. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 1999 (Reaffirmed 2021).

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive 2019.

F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar 2021.

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy 1999 (Reaffirmed 2019).

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout 1999 (Reaffirmed 2019).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout 1999 (Reaffirmed 2019).

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework 2017.

K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar 1999 (Reaffirmed 2019).

L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2005 (Reaffirmed 2021).

M. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive 2021.

N. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar 2019.

O. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation 2019.

P. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation 2019.

Q. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2014 (Reaffirmed 2019).

R. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation 2014 (Reaffirmed 2019).

S. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar 2019.

T. ANSI A137.1 - American National Standard Specifications for Ceramic Tile 2021.

U. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products 2018.

V. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel 2018.

W. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2021.

X. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2016a.

Y. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation 2021.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

2. Refer to Division 01 for Sustainable Design Requirements: Requirements for low-emitting materials.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.

D. Setting and Grouting Systems: Indicate TCNA installation system for each type of tile and setting assembly.

E. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Installer's Qualification Statement:

1. Submit documentation of completion of apprenticeship and certification programs.

H. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Tile: 1 percent of each size, color, and surface finish combination.

1.06 QUALITY ASSURANCE

A. Maintain one copy of ANSI A108/A118/A136 and TCNA (HB) on site.

B. Installer Qualifications:

1. Company specializing in performing tile installation, with a minimum of five years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers:

1. Ceramic Technics, contact: Fusun Yalcinkaya, fusun@cermictechnics.com

2. or equal.

B. Porcelain Stone Textured: Type CT-01 ANSI A137.1 standard grade.

1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.

2. Size: 12 in by 24 in inch, nominal.

3. Thickness: 3/8 inch. (10mm)

4. Surface Finish: Unpolished, textured.

5. Color(s): Taupe/Dark in Natural Finish

6. Pattern: Ashlar

7. Products:

a. Firenze Design Stones

2.02 TRIM AND ACCESSORIES

A. Non-Ceramic Trim: Satin Nickel Anodized Aluminum, style and dimensions to suit application and as indicated on the drawings, for setting using tile mortar or adhesive.

1. Applications:

a. Thresholds at door openings.

b. Floor to wall joints.

2. Manufacturers:

a. Schluter-Systems: www.schluter.com/#sle.

2.03 SETTING MATERIALS

A. Manufacturers:

1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
2. Custom Building Products: www.custombuildingproducts.com/#sle.
3. LATICRETE International, Inc: www.laticrete.com/#sle.
4. or equal.

B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.

1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.
2. Products:
   a. ARDEX Engineered Cements; ARDEX X 5: www.ardexamericas.com/#sle.
   b. Custom Building Products; ProLite Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.
   c. LATICRETE International, Inc[<>]: www.laticrete.com/#sle.
   d. or equal.

2.04 GROUTS

A. Manufacturers:

1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
2. Custom Building Products: www.custombuildingproducts.com/#sle.
3. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.

B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.

1. Applications: Use this type of grout at walls and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Color(s): As selected by Architect from manufacturer's full line.
4. Products:
   a. ARDEX Engineered Cements; ARDEX FL: www.ardexamericas.com/#sle.

b. Custom Building Products; Prism Color Consistent Grout: www.custombuildingproducts.com/#sle.

c. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.

C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.

1. Applications: Where indicated at floors.

2. Color(s): As selected by Architect from manufacturer's full line.

3. Products:

a. ARDEX Engineered Cements; ARDEX WA: www.ardexamericas.com/#sle.

b. Custom Building Products; CEG-IG 100% Solids Industrial Grade Epoxy Grout: www.custombuildingproducts.com/#sle.

c. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.

2.05 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.

1. Applications: Between tile and plumbing fixtures.

2. Color(s): As selected by Architect from manufacturer's full line.

3. Products:

a. ARDEX Engineered Cements; ARDEX SX: www.ardexamericas.com/#sle.

b. Custom Building Products; Commercial 100% Silicone Caulk: www.custombuildingproducts.com/#sle.

c. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.

B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.

1. Composition: Water-based colorless silicone.

2. Color(s): As selected by Architect from manufacturer's full line.

3. Products:

a. Merkrete, by Parex USA, Inc; Merkrete Revive: www.merkrete.com/#sle.

2.06 ACCESSORY MATERIALS

A. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.

1. Crack Resistance: No failure at 1/16 inch gap, minimum; comply with ANSI A118.12.

2. Fluid or Trowel Applied Type:

a. Material: Synthetic rubber or Acrylic.

b. Thickness: 25 mils, minimum, dry film thickness.

c. Products:

1) ARDEX Engineered Cements; ARDEX 8+9: www.ardexamericas.com/#sle.

2) Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: www.custombuildingproducts.com/#sle.

3) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.

B. Backer Board: See Section 09 21 16 - Gypsum Board Assemblies. Coated glass mat type complying with ASTM C1178/C1178Minorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.

C. Mesh Tape: 2-inch-wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

B. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with Section 09 21 16 - Gypsum Board Assemblies.

3.03 INSTALLATION - GENERAL

A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed or with metal trim as detailed.

F. Install ceramic accessories rigidly in prepared openings.

G. Install non-ceramic trim in accordance with manufacturer's instructions.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.

1. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout.

B. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

3.05 INSTALLATION - WALL TILE

A. Grout with standard grout as specified above. Sealed with grout sealer as recommended by grout manufacturer

B. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

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SECTION 09 65 00 - RESILIENT FLOORING & BASE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring: LVT

B. Resilient base.

C. Installation accessories.

1.02 RELATED REQUIREMENTS

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

B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

1.03 REFERENCE STANDARDS

A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers 1998 (Reapproved 2015).

B. ASTM D6866 - Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis

C. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).

D. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile 2020.

E. ASTM F1861 - Standard Specification for Resilient Wall Base 2021.

F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2023.

G. NSF 332 - Sustainability Assessment for Resilient Floor Coverings 2015.

H. RFCI - Resilient Floor Covering Institute FloorScore Program

I. UL 2824 - GREENGUARD Certification Program Method for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Division 01 for submittal procedures.

B. CALGreen Submittals:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content.

2. Product Data for CALGreen 5.504.4.6 – Finish Material Pollutant Control; Resilient Flooring Systems: For resilient tile flooring, documentation indicating certification under the Resilient Floor Covering Institute (RFCI) FloorScore program.

C. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

D. Shop Drawings: Indicate seaming plans and floor patterns.

E. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.

F. Sustainable Design Submittal: Submit VOC content documentation for flooring and adhesives.

G. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

H. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.

I. Manufacturer's Qualification Statement.

J. Installer's Qualification Statement.

K. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

L. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Flooring Material: 20 square feet of each type and color.

2. Extra Wall Base: 20 linear feet of each type and color.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Protect roll materials from damage by storing on end.

E. Do not double stack pallets.

1.07 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 MATERIAL REQUIREMENTS, GENERAL

A. Resilient flooring systems. For 80 percent of floor area receiving resilient flooring, installed resilient flooring shall meet at least one of the following:

1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;

2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;

3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or

4. Products certified under the UL GREENGUARD Gold (formerly the Greenguard Children & Schools program).

B. Adhesives: All leveling compounds, adhesives and sealers shall meet the requirements of Table 5.504.4.1.

2.02 TILE FLOORING

A. Vinyl Tile: Luxury Vinyl Tile (LVT).

1. Manufacturers:

a. Shaw Contract; contact Meg Lievers: meg.lievers@shawcontract.com

b. Or approved equal.

2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.

3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.

4. Mold and Microbial Resistance: Highly resistant when tested in accordance with ASTM D6329; certified in accordance with UL 2824.

5. VOC Content Limits: As specified in Section 01 81 13 - NTU Sustainable Design Requirements.

6. NSF 332 Certification: Platinum level.

7. Plank Tile Size: 6 x 48 inches

8. Total Thickness: 5 MM

9. Pattern: Terrain II 20 Mil 5MM.

10. Color: Echo 00775

2.03 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset Type TS rubber, vulcanized thermoset; coved (toe) at hard surface locations.

1. Manufacturers:

a. Roppe Corporation; Contours Profiled Wall Base System: www.roppe.com/#sle.

b. Or approved equal.

2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.

3. Height: 4 inches.

4. Thickness: 0.125 inch.

5. Finish: Satin.

6. Length: Roll.

7. Color: to be selected by Architect from manufacturer's standard colors.

8. Accessories: Premolded external corners and internal corners.

2.04 ACCESSORIES

A. Subfloor Filler: Type recommended by flooring material manufacturer and in accordance with Section 09 05 61 - Common Work Results for Flooring Preparation.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

1. VOC Content Limits: As specified in Section 01 81 13 - Sustainable Design Requirements.

C. Filler for Coved Base: Plastic.

D. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive a resilient base.

C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61 - NTU Common Work Results for Flooring Preparation.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

1. Resilient Strips: Attach to substrate using adhesive.

D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

E. Install flooring in recessed floor access covers, maintaining floor pattern.

F. At movable partitions, install flooring under partitions without interrupting floor pattern.

G. Install feature strips where indicated.

3.04 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

C. Install plank tile with a random offset of at least 6 inches from adjacent rows.

3.05 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.07 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 67 00 - FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-applied flooring.

1.02 RELATED REQUIREMENTS

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

B. Section 07 92 00 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. Refer to Division 1 for submittal procedures.

B. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.

C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

D. Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each floor material for each color specified.

E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and application rate for each coat.

G. Manufacturer's Qualification Statement.

H. Applicator's Qualification Statement.

I. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.

B. Applicator Qualifications: Company specializing in performing the work of this section.

1. Minimum 3 years of documented experience.

2. Approved by manufacturer.

C. Supervisor Qualifications: Trained by product manufacturer, under direct full time supervision of manufacturer's own foreman.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store resin materials in a dry, secure area.

B. Store materials for three days prior to installation in the area of installation to achieve temperature stability.

1.07 FIELD CONDITIONS

A. Maintain minimum temperature in storage area of 55 degrees F.

B. Store materials in area of installation for minimum period of 24 hours prior to installation.

C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.01 PRODUCT REQUIREMENTS

A. Refer to Section 01 81 13 - NTU Sustainable Design Requirements: Requirements for low-emitting materials, Architectural Paints and Coatings.

2.02 MANUFACTURERS

A. Fluid-Applied Flooring:

1. Stonhard Inc.: www.stonhard.com/#sle.

2. PPG Flooring: www.ppgpaints.com/#sle and www.ppgpmc.com/home.aspx/#sle.

3. Sherwin-Williams Company: www.protective.sherwin-williams.com/#sle.

4. Sika Corporation: www.sikafloorusa.com/#sle.

2.03 FLUID-APPLIED FLOORING SYSTEMS

A. Fluid-Applied Flooring: Multi-coat slip-resistant system consisting of epoxy base coats, quartz aggregates, and epoxy top coat.

B. Basis of Design Product:

1. Option A: Stonhard Inc; Stoneshield SLT.

2. Option B: PPG; Deco-Protect Trowelled Color Quartz System.

C. System Characteristics:

1. Color and Pattern: Match existing and adjacent kitchen flooring.

2. Wearing Surface: to match existing.

3. Integral Cove Base: to match existing.

4. Overall System Thickness: Nominal 2mm - or to match existing.

D. System Components: Manufacturer's standard components that are compatible with each other and as follows:

1. Primer:

a. Material Basis Option A: Stonhard Standard Primer

b. Material Basis Option B: PPG ICO Primer LV

2. Sealer

a. Material Basis: Stonkote CE4.

b. Material Basis Option B: PPG PM 100.

c. Resin: Epoxy

d. Formulation Description: (2) two-component, 100% solids, UV Stable.

e. Type: Clear.

f. Finish: Gloss.

g. Number of Coats: One.

h. Texture level: Standard or medium.

E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Tensile Strength: 1,600 psi per ASTM C307

2. Flexural Strength: 4,000 psi per ASTM C580

3. Flexural Modulus of Elasticity: 1.0×10^6 psi per ASTM C580

4. Hardness: 85 to 90 per ASTM D2240, Shore D

5. Impact Resistance: > 160 in./lbs. per ASTM D2794
6. Abrasion Resistance: 0.06 gm max. weight loss per ASTM D 4060, CS-17
7. Flammability: Class 1 per ASTM E-648.
8. Thermal Coefficient of Linear Expansion: 1.4 x 10^{-5} in./in. ^{o}F
9. Water Absorption: 0.1% per ASTM C 413
10. VOC Content per ASTM D2369:
    a. Stonshield Undercoat – 34 g/l
    b. Stonkote CE4 – 34 g/l
11. Cure Rate @ 77^{o}F/25^{o}C: 12 hours foot traffic, 24 hours normal operations
12. Formulation Description: (2) two component, 100 percent solids.
13. Application Method: Squeegee and roller.
14. Number of Coats: One.
15. Broadcast Media:
    a. Material Basis: Quartz aggregate.
    b. Type: Pigmented.
    c. Finish: Standard.
    d. Number of Coats: One.
    e. Pattern: Tweed.
16. Undercoat:
    a. Material Basis Option A: Stonshield undercoat.
    b. Material Basis Option B: PPG DBS undercoat.
    c. Resin: Epoxy
    d. Formulation Description: (2) two-component, 100% solids, UV Stable.
    e. Type: Clear.
    f. Finish: Gloss.
    g. Number of Coats: One.
17. Broadcast Media:

a. Material Basis Option A: Stonshield quartz aggregate

b. Material Basis Option B: PPG DBS Color Quartz aggregate

c. Type: Pigmented.

d. Finish: Standard.

e. Number of Coats: One.

f. Pattern: Tweed.

2.04 ACCESSORIES

A. Base Caps: Extruded anodized aluminum with projecting base of 1/8 inch; clear color.

B. Cant Strips: Molded of flooring resin material.

C. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.

D. Primer: Type recommended by fluid-applied flooring manufacturer.

E. Sealer: Manufacturer's recommended product for application at slab control joints; Stonflex MP7 joint fill material.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall and subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied flooring installation by testing for moisture and alkalinity (pH).

1. Test in accordance with Section 09 05 61 - NTU Common Work Results for Flooring Preparation, and flooring system manufacturer's published recommendations.

2. Obtain instructions if test results are not within limits recommended by fluid-applied flooring manufacturer.

3. Follow moisture and alkalinity remediation procedures in Section 09 05 61 - NTU Common Work Results for Flooring Preparation.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.

C. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations.

D. Vacuum clean substrate.

E. Apply primer to surfaces required by flooring manufacturer.

F. Chase edges to “lock” the flooring system into the concrete substrate along lines of termination.

G. Penetration Treatment: Lap and seal resinous system onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.

3.03 INSTALLATION - ACCESSORIES

A. Install cant strips at base of walls where flooring is to be extended up wall as base.

B. Install terminating cap strip at top of base; attach securely to wall substrate.

3.04 INSTALLATION - FLOORING

A. Apply in accordance with manufacturer's instructions.

B. Finish to smooth level surface.

C. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

3.05 FIELD QUALITY CONTROL

A. Refer to Section 01 40 00 - NTU Quality Requirements for additional requirements.

3.06 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Barricade area to protect flooring until fully cured.

END OF SECTION

SECTION 09 68 13 - TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

B. Removal of existing carpet tile.

1.02 RELATED REQUIREMENTS

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

B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

C. Section 09 65 00 - Resilient Flooring & Base.

1.03 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials 2016 (Reapproved 2021).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).

C. CRI (GLP) - Green Label Plus Testing Program - Certified Products Current Edition.

D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2023.

1.04 SUBMITTALS

A. CALGreen Submittals:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content.

2. Product Data for CALGreen 5.504.4.4 – Finish Material Pollutant Control; Carpet Systems: For carpet tile, documentation indicating compliance with testing and product requirements of CRI's "Green Label Plus" program.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Shop Drawings: Indicate layout of joints.

D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

I. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Carpet Tiles: Quantity equal to 10 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tile Carpeting:

1. Shaw Contract; contact Meg Lievers: meg.lievers@shawcontract.com

2. Or approved equal.

2.02 SUSTAINABLE MATERIAL REQUIREMENTS

A. Recycled Content: Provide carpet tile products with average recycled content such that postconsumer recycled content plus one-half of pre-consumer recycled content is not less than 45 percent.

2.03 MATERIALS

A. Tile Carpeting, Type CPT-01: Tufted, manufactured in one color dye lot.

1. Tile Size: 24 by 24 inch, nominal.

2. Color: Road Trip 75105.

3. Pattern: Diffuse Ecoworx.

4. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.

5. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").

6. VOC Content: Provide CRI (GLP) certified product; in lieu of labeling, independent test report showing compliance is acceptable.

2.04 ACCESSORIES

A. Subfloor Filler: Type recommended by flooring material manufacturer and in accordance with Section 09 05 61 - Common Work Results for Flooring Preparation.

B. Edge Strips: Schluter transition strips.

C. Adhesives:

1. Compatible with materials being adhered; maximum VOC content as specified in Section 01 81 13 - Sustainable Design Requirements.

2. Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI (GLP) certified; in lieu of labeled product, independent test report showing compliance is acceptable.

D. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove existing carpet tile.

B. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61 - Common Work Results for Flooring Preparation.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.

F. Run carpet into recessed areas such as the open kneespace below counters and work surfaces.

G. Locate change of color or pattern between rooms under door centerline.

H. Fully adhere carpet tile to substrate.

I. Trim carpet tile neatly at walls and around interruptions.

J. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

A. See Division 01 for Final Cleaning and for additional requirements.

B. Remove excess adhesive without damage, from floor, base, and wall surfaces.

C. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 90 00 - PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation and field painting of exposed interior items and surfaces.

B. Surface preparation and field painting of exposed exterior items and surfaces.

C. Surface preparation and field application of exterior high-performance coating systems to items and surfaces scheduled.

D. Painting of exposed bare and covered pipes and ducts, hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

1.02 RELATED REQUIREMENTS

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

B. Section 05 50 00 - Metal Fabrications: Shop finishing of metal fabrications.

C. Section 06 20 00 - Finish Carpentry: Shop priming architectural woodwork.

D. Section 07 92 00 - Joint Sealants.

E. Section 08 11 13 - Hollow Metal Doors and Frames: Factory priming of doors and frames.

F. Section 09 21 16 - Gypsum Board Assemblies: Gypsum board finish levels.

1.03 DEFINITIONS

A. General: Paint includes coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats. Standard coating terms are defined in ASTM D16.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85 degree meter.

2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60 degree meter.

3. Semi-Gloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60 degree meter.

4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60 degree meter.

B. Environments: The following terms distinguish between different corrosive exposures:

1. "Severe environments" are highly corrosive industrial atmospheres with sustained exposure to high humidity and condensation and with frequent cleaning using strong chemicals. Environments with heavy concentrations of strong chemical fumes and frequent splashing and spilling of harsh chemical products are severe environments.

2. "Moderate environments" are corrosive industrial atmospheres with intermittent exposure to high humidity and condensation, occasional mold and mildew development, and regular cleaning with strong chemicals. Environments with exposure to heavy concentrations of chemical fumes and occasional splashing and spilling of chemical products are moderate environments.

3. "Mild environments" are industrial atmospheres with normal exposure to moderate humidity and condensation, occasional mold and mildew development, and infrequent cleaning with strong chemicals. Environments with low levels of mild chemical fumes and occasional splashing and spilling of chemical products are mild environments. Normal outdoor weathering is also considered a mild environment.

1.04 REFERENCE STANDARDS

1.05 SYSTEM DESCRIPTION

A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2019.

B. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers 2017, v1.2.

C. EN 15804 - Sustainability of Construction Works - Environmental Product Declarations - Core Rules for the Product Category of Construction Products 2022 (Corrigendum 2021).

D. ISO 14025 - Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures 2006.

E. ISO 14040 - Environmental Management - Life Cycle Assessment - Principles and Framework 2006, with Amendment (2020).

F. ISO 14044 - Environmental Management - Life Cycle Assessment - Requirements and Guidelines 2006, with Amendment (2020).

G. ISO 21930 - Sustainability in Buildings and Civil Engineering Works — Core Rules for Environmental Product Declarations of Construction Products and Services 2017.

H. SSPC-SP 6 - Commercial Blast Cleaning 2007.

1.06 SUBMITTALS

A. CALGreen Submittals:

1. Product Data for CALGreen 5.504.4.3 - Finish Material Pollutant Control, Paints and Coatings: Product data and material safety data sheets (MSDS) for coatings, including printed statement of chemical composition and VOC content of each product used.

2. Aerosol paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for VOC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of California Code of Regulations, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

3. Field Verification of on-site product containers: If required by Authority Having Jurisdiction.

B. Product Data: For each paint system indicated, including:

1. Material List: An inclusive list of required coating materials. Indicate each material and cross reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2. Preparation instructions and recommendations.

3. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

C. Verification Samples: For each finish product specified, two samples, minimum size 8 inch square, representing actual product, color, and patterns.

1. Step coats on Samples to show each coat required for system.

2. Label each coat of each Sample.

3. Label each Sample for location and application area.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this project, whose work has resulted in applications with a record of successful in-service performance.

B. Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

C. Paint exposed surfaces. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 degrees F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1.09 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside the manufacturer's absolute limits.

B. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 degrees F and 90 degrees F.

C. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 degrees F and 95 degrees F.

D. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.10 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.

B. Quantity: Furnish Owner with an additional three percent, but not less than 1 gallon or 1 case, as appropriate, of each material and color applied.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer: PPG Paints, 400 Bertha Lamme Drive Cranberry, PA 16066. Toll Free Tel: 888-PPG-IDEA. Web: www.ppgpaints.com/#sle.

B. Other Acceptable Manufacturers:

1. Dunn-Edwards.

2. Kelly Moore

3. Sherwin Williams.

2.02 PAINT MATERIALS - GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. VOC Classification: Provide high-performance coating materials, including primers, undercoats, and finish-coat materials, that meet the applicable local, state or federal VOC requirements.

C. CalGreen Coating VOC Limits: Refer to Section 01 81 13 - NTU Sustainable Design Requirements.

D. Color: Refer to Drawings for paint sheen and color.

2.03 INTERIOR PRIMERS

A. Interior Gypsum Board Primer: Factory-formulated, zero VOC latex-based primer for interior application.

1. PPG Paints; 6-4900XI Speedhide zero Interior Zero VOC Latex Sealer (0 g/L VOC).

a. Applied at a dry film thickness of not less than 1.2 mils.

B. Interior Wood Primer: Factory-formulated, zero VOC latex-based interior wood primer.

1. PPG Paints; 6-4900XI Speedhide zero Interior Zero VOC Latex Sealer (0 g/L VOC).

a. Applied at a dry film thickness of not less than 1.2 mils.

C. Interior Ferrous, Non-Ferrous, Galvanized Metal, and Aluminum Primer: Factory-formulated waterborne acrylic rust-inhibitive metal primer.

1. PPG Paints; 4020 PF Series Pitt-Tech Plus Interior/Exterior DTM Industrial Primer (91 g/L VOC).

a. Applied at a dry film thickness of not less than 2.2 mils.

2.04 EXTERIOR PRIMERS

A. Exterior Wood Primer for Acrylic Enamels: Factory-formulated acrylic wood primer for exterior application.

1. PPG Paints; 17-921XI Series Seal Grip Acrylic Universal Primer (84 g/L VOC).

a. Applied at a dry film thickness of not less than 1.6 mils.

B. Exterior Ferrous, Non-Ferrous, Galvanized Metal, and Aluminum Primer: Factory-formulated waterborne acrylic rust-inhibitive metal primer.

1. PPG Paints; 4020 PF Series Pitt-Tech Plus Interior/Exterior DTM Industrial Primer (91 g/L VOC).

a. Applied at a dry film thickness of not less than 2.2 mils.

2.05 INTERIOR FINISH COATS

A. Interior Flat Latex (Gloss Level 1): Factory-formulated flat, zero VOC latex-based interior paint.

B. Interior Eggshell Acrylic Enamel (Gloss Level 2): Factory-formulated eggshell, zero VOC latex-based interior enamel.

1. PPG Paints; 6-4310XI Series Speedhide zero Interior Latex Eggshell (0 g/L VOC).

a. Applied at a dry film thickness of not less than 1.4 mils.

C. Interior Eggshell Acrylic Enamel (Gloss Level 3): Factory-formulated satin, zero VOC latex-based interior enamel.

1. PPG Paints; 6-4410XI Series Speedhide Zero Interior Zero VOC Latex Satin (0 g/L VOC).

a. Applied at a dry film thickness of not less than 1.3 mils.

D. Interior Satin Acrylic Enamel (Gloss Level 4): Factory-formulated satin, waterborne acrylic interior enamel.

1. PPG Paints; V51-410 Series Break-Through Interior/Exterior Water-Borne Acrylic Satin (less than 50 g/L VOC).

a. Applied at a dry film thickness of not less than 1.3 mils.

E. Interior Semi-Gloss Acrylic Enamel (Gloss Level 5): Factory-formulated semi-gloss, zero VOC latex-based enamel.

1. PPG Paints; 6-4510XI Series Speedhide zero Interior Zero VOC Latex Semi-Gloss (0 g/L VOC).

a. Applied at a dry film thickness of not less than 1.3 mils.

F. Interior Full-Gloss Acrylic Enamel (Gloss Level 6): Factory-formulated full-gloss waterborne acrylic interior enamel.

1. PPG Paints; V71-610 Series Break-Through Interior/Exterior Water-Borne Acrylic Gloss (less than 50 g/L VOC).

a. Applied at a dry film thickness of not less than 1.5 mils.

G. Interior Eggshell Waterborne Acrylic Epoxy:

1. PPG Paints; 16-310 Series Pitt-Glaze WB1 Interior Pre-Catalyzed Water-Borne Acrylic Epoxy Eggshell (95 g/L VOC).

a. Applied at a dry film thickness of not less than 1.5 mils.

H. Interior Semi-Gloss Waterborne Acrylic Epoxy:

1. PPG Paints; 16-510 Series Pitt-Glaze WB1 Interior Pre-Catalyzed Water-Borne Acrylic Epoxy Semi-Gloss (97 g/L VOC).

a. Applied at a dry film thickness of not less than 1.5 mils.

I. Interior Flat Latex Dry Fog:

1. PPG Paints; 6-725XI Speedhide Super-Tech WB Interior Dry Fog Latex Flat (30 g/L VOC).

a. Applied at a dry film thickness of not less than 2.2 mils.

J. Interior Eggshell Latex Dry Fog:

1. PPG Paints; 6-724XI Speedhide Super-Tech WB Interior Dry Fog Latex Eggshell (30 g/L VOC).

a. Applied at a dry film thickness of not less than 2.2 mils.

K. Interior Semi-Gloss Latex Dry Fog:

1. PPG Paints; 6-727XI Series Speedhide Super Tech WB Interior Dry Fog Latex Semi-Gloss (less than 50 g/L VOC).

a. Applied at a dry film thickness of not less than 2.2 mils.

L. Interior/Exterior High Performance Satin Polysiloxane:

1. PPG Paints; PSX 805 Engineered Siloxane Satin (75 g/L VOC).

a. Applied at a dry film thickness of not less than 3.0 mils.

2.06 EXTERIOR FINISH COATS

A. Exterior Flat Acrylic Paint: Factory-formulated flat 100% acrylic latex paint for exterior application.

1. PPG Paints; 6-610XI Series Speedhide Exterior 100 percent Acrylic Latex Flat (less than 50 g/L VOC).

a. Applied at a dry film thickness of not less than 1.5 mils.

B. Exterior Satin Acrylic Paint: Factory-formulated satin waterborne acrylic paint for exterior application.

1. PPG Paints; V51-410 Series Break-Through Interior/Exterior Water-Borne Acrylic Satin (less than 50 g/L VOC).

a. Applied at a dry film thickness of not less than 1.3 mils.

Metal Substrates

2. PPG Paints; 90-1110 Pitt-Tech Plus Interior/Exterior DTM Industrial Enamel Satin (85 g/L VOC).

a. Applied at a dry film thickness of not less than 2.0 mils.

C. Exterior Semi-Gloss Acrylic Paint: Factory-formulated semi-gloss waterborne acrylic enamel for exterior application.

Metal Substrates

1. PPG Paints; 4216 HP Series Pitt-Tech Plus Interior/Exterior DTM Industrial Enamel Semi-Gloss (90 g/L VOC).

    a. Applied at a dry film thickness of not less than 2.0 mils.

D. Exterior Full-Gloss Acrylic Enamel: Factory-formulated full-gloss waterborne acrylic-latex enamel for exterior application.

1. PPG Paints; 90-1310 Pitt-Tech Plus Interior/Exterior DTM Industrial Enamel Gloss (90 g/L VOC).

    a. Applied at a dry film thickness of not less than 2.0 mils.

E. Exterior High Performance Low-VOC Polyester Acrylic Polurethane Coating: for all exterior metal surfaces.

1. Intermediate Coat: PPG Paints; Amerlock 400 or Amerlock 2 400 epoxy high solids intermediate coat as recommended by manufacturer for intended applications. (<100g/L).

    a. Applied at a dry film thickness of not less than 2.0 mils.

2. Topcoat: PPG Paints; PMC Amershield VOC, Low-VOC Polyester Acrylic Polurethane Coating (<85 g/L VOC).

    a. Applied at a dry film thickness of not less than 3.0 mils.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

2. If a potential incompatibility of primers applied by others exists, obtain the following from the primer applicator before proceeding:

    a. Confirmation of primer's suitability for expected service conditions.

b. Confirmation of primer's ability to be top coated with materials specified.

3.02 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.

2. Cementitious Substrates: Prepare concrete, brick, concrete masonry block, and cement plaster surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.

a. Use abrasive blast-cleaning methods if recommended by coating manufacturer.

b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.

3. Wood Substrates: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Smoothly sand surfaces exposed to view and dust off.

a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer, before applying primer.

b. Immediately on delivery, prime edges, ends, faces, undersides, and backsides of wood to be coated.

c. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

4. Ferrous Metal Substrates: Clean ungalvanized ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign

substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations.

a. Blast-clean steel surfaces as recommended by coating manufacturer and according to SSPC-SP 6.

b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, solvent clean, and touch up with same primer as the shop coat.

5. Non-Ferrous Metal Substrates: Clean non-ferrous and galvanized surfaces according to manufacturer's written instructions for the type of service, metal substrate, and application required.

a. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.

2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.

3. Use only the type of thinners approved by manufacturer and only within recommended limits.

4. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.03 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

B. General: Apply high-performance coatings according to manufacturer's written instructions.

1. Use applicators and techniques best suited for the material being applied.

2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.

3. Coating surface treatments and finishes are indicated in the coating system descriptions.

4. Provide finish coats compatible with primers used.

5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. The number of coats and film thickness required is the same regardless of application method.

2. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

3.04 FIELD QUALITY CONTROL

A. See Section 01 45 23 - NTU Testing and Inspecting Services, for general requirements for field inspection and testing.

B. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:

1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to project will be taken, identified, sealed, and certified in the presence of Contractor.

2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.05 CLEANING

A. After completing painting, clean glass and paint spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.06 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

C. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces.

3.07 INTERIOR PAINT SCHEDULE

A. Concrete:

1. General: Two finish coats over a primer.
2. Primer: Interior zero VOC, **latex-based** primer as specified for substrate indicated.
3. Finish Coats: Interior low-sheen, zero VOC **latex-based** enamel.

B. Gypsum Board:

1. Walls and Ceilings to receive Flat Finish:
    a. General: Two finish coats over a primer.
    b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
    c. Finish Coats: Interior flat zero VOC **latex-based** paint.
2. Walls and Ceilings to receive Low-Luster (Eggshell) Finish:
    a. General: Two finish coats over a primer.
    b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
    c. Finish Coats: Interior low-luster (eggshell) zero VOC **latex-based** enamel.
3. Walls and Ceilings to receive Satin Finish:
    a. General: Two finish coats over a primer.
    b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
    c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.
4. Walls and Ceilings to receive Semi-Gloss Finish:
    a. General: Two finish coats over a primer.
    b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
    c. Finish Coats: Interior semi-gloss zero VOC **latex-based** enamel.
5. Walls and Ceilings to receive Full-Gloss Finish:
    a. General: Two finish coats over a primer.
    b. Primer: Interior zero VOC l**atex-based** primer as specified for substrate indicated.
    c. Finish Coats: Interior gloss zero VOC **waterborne acrylic** enamel.
6. Walls and Ceilings to receive Semi-Gloss Epoxy Finish:

a. General: Two finish coats over a primer.

b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.

c. Finish Coats: Interior Semi-Gloss **Pre-Catalyzed Water-Borne Acrylic Epoxy** finish.

C. Metal Doors and Frames, and Other Non-Prefinished Miscellaneous Metal, metal stairs, pipe and tube railings, and decorative metal exposed piping, conduits, and ductwork, :

1. Ferrous Metal:

a. General: Two finish coats over a primer.

b. Primer: Interior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).

c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.

2. Zinc-Coated Metal:

a. General: Two finish coats over a primer.

b. Primer: Interior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).

c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.

D. Typical Exposed Structural and Steel Items not indicated to be Painted with Interior High Performance Topcoats.

1. Ferrous Metal:

a. General: Two finish coats over a primer.

b. Primer: Interior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).

c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.

2. Zinc-Coated Metal:

a. General: Two finish coats over a primer.

b. Primer: Interior **waterborne acrylic** as specified for substrate indicated (not required on shop-primed items).

c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.

E. Selected Exposed Steel Items indicated to be Painted with Interior High Performance Topcoats including exposed structural steel, architecturally exposed structural steel, metal stairs, pipe and tube railings, and decorative metal.

1. General:One topcoat over shop primer.
2. Primer: Shop-applied in applicable Division 5 Section.
3. Topcoat: Interior high performance **satin polysiloxane**

F. Wood - Opaque Finish: Walls and Ceilings to receive Flat Finish:

1. General: Two finish coats over a primer.
2. Primer: Interior zero VOC, **latex-based** primer as specified for substrate indicated.
3. Finish Coats: Interior Flat zero VOC **latex-based** paint.

G. Wood - Opaque Finish: Trim to receive Satin Finish:

1. General: Two finish coats over a primer.
2. Primer: Interior zero VOC, l**atex-based** primer as specified for substrate indicated.
3. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.

H. Wood - Transparent Finish and varnish for miscellaneous field-finished wood::

1. General: Two coats varnish minimum over one coat sanding sealer and one coat stain.
2. Stain: Interior **water based**.
3. Sanding Sealer: Interior **water base**d.
4. Varnish: Interior clear satin **waterborne acrylic/urethane**.

I. Wood - Transparent Penetrating Finish for softwood substrates:

1. General: One coat penetrating sealer over one coat stain.
2. Stain: Interior bio-based oil.
3. Sealer: Interior clear waterborne urethane.

3.08 EXTERIOR PAINT SCHEDULE

A. Cement Plaster: Refer to Section 09 24 00 - NTU Cement Plastering for finsh coat system.

B. Metal Doors and Frames, and Other Non-Prefinished Miscellaneous Metal:

1. Ferrous Metal:
    a. General: Two finish coats over primer.
    b. Primer: Exterior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).
    c. Finish Coats: Exterior semi-gloss **waterborne acrylic** enamel.

2. Zinc-Coated Metal:

    a. General: Two finish coats over primer.

    b. Primer: Exterior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).

    c. Finish Coats: Exterior semi-gloss **waterborne acrylic** enamel.

C. Aluminum:

1. General: Two finish coats over primer.

2. Primer: Exterior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).

3. Finish Coats: Exterior semi-gloss **waterborne acrylic** enamel.

D. Selected Exposed Steel Items indicated to be Painted with Exterior High Performance Topcoats including exposed structural steel, architecturally exposed structural steel, metal stairs, pipe and tube railings, and decorative metal.

1. General: One topcoat over one intermediate coat and shop primer.

2. Primer: Shop-applied in applicable Division 05 Section.

3. Intermediate Coat: **Epoxy high-solids** intermediate coat as recommended by manufacturer of high-performance topcoat for intended application.

4. Topcoat: Exterior semi-gloss **Polyester Acrylic Polurethane** Coating

E. Wood: Walls and Soffits to receive Stain Finish:

1. General: One finish coat, minimum.

2. Finish Coat(s): Exterior Semi-Tranparent waterborne stain.

F. Wood: Walls and Soffits to receive Semi-Transparent Bio-Based Wood Finish

1. General: Exterior clear sealer over two coats stain.

2. Stain: Exterior bio-based oil.

3. Sealer: Exterior clear sealer.

G. Poly-Ash Composite Siding:

1. General: Two finish coats over pre-primed composite material

2. Primer: Pre-primed. See Section 07 46 49 - NTU Poly-Ash Siding and Trim

3. Finish Coats: Exterior flat **acrylic latex** paint.

END OF SECTION

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SECTION 10 14 00
SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Room and door signs.

B. Building identification signs.

1.02 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.

B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

1.03 SUBMITTALS

A. See Division 01 for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
3. Submit for approval by Owner through Architect prior to fabrication.

D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.06 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flat Signs:

1. Rowmark. Ultra-Mattes Front, "Driftwood Alpine"
2. Substitutions: See Division 01 for Substitutions and Product Requirements.

2.02 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign for every new doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
   1. Sign Type: Flat signs with engraved panel media as specified.
   2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
   3. Character Height: 1 inch.
   4. Sign Height: 2 inches, unless otherwise indicated.
   5. Restrooms: Identify with pictograms, and as indicated on sheet G3.24, and braille.

2.03 SIGN TYPES

A. Flat Signs: Signage media without frame.
   1. Edges: Beveled.
   2. Corners: Radiused.
   3. Wall Mounting of One-Sided Signs: Tape adhesive.

B. Color and Font: Unless otherwise indicated:
   1. Character Font: Helvetica, Arial, or other sans serif font.
   2. Character Case: Upper case only.
   3. Background Color: to be determined from manufacturer's standard colors.
   4. Character Color: Contrasting color to be selected from manufacturer's standard colors.

2.04 TACTILE SIGNAGE MEDIA

A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
   1. Product: Ultra-Mattes Front, “Driftwood Alpine".
   2. Total Thickness: 1/8 inch.

2.05 ACCESSORIES

A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

B. Exposed Screws: compatible with associate finishes and as approved by Owner/Architect.

C. Tape Adhesive: Double sided tape, permanent adhesive.

D. Back-panels for signs mounted on glass.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 10 28 00
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Under-lavatory pipe supply covers.

C. Utility/Janitor room accessories.

1.02 RELATED REQUIREMENTS

A. Section 09 30 00 - Tiling: Ceramic washroom accessories.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures 2011.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2012.

F. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror 2008 (Reapproved 2013).

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2017.

H. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use 2004, with Editorial Revision (2016).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

A. See Division 01 for Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. Bobrick Washroom Equipment, Inc: www.bobrick.com.
   2. Substitutions: See Division 01 - Product Requirements.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

B. Keys: Provide three keys for each accessory to Owner; master key lockable accessories.

C. Stainless Steel Sheet: ASTM A666, Type 304.

D. Adhesive: Two component epoxy type, waterproof.

E. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

2.04 COMMERCIAL TOILET ACCESSORIES

A. Toilet Paper Dispensers: Double roll, partition and recessed mounted, for two, standard core rolls up to 5 1/4" in diameter. Toilet Seat-cover dispenser, Sanitary Napkin Disposal where specified.
   1. Products:
      a. Bobrick B-3091 recessed for wood framed walls
      b. Bobrick B-3092 recessed for wood framed walls - opposite hand from B-3091

B. Paper Towel Dispenser: Recessed folded-paper type.
   1. Cover: Stainless steel.
   2. Mounting: Fully recessed.
   3. Products:
      a. Bobrick B-359 Recessed.

C. Motorized Hand Dryer: Excel Dryer Inc., “ThinAir” Hand Dryer, TA-SB, brushed stainless steel.

D. Soap Dispenser: Foam soap dispenser, deck-mounted on lavatory, with container concealed below deck: B-823. At each faucet.

E. Grab Bars: Stainless steel, smooth surface.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force, minimum.
      b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
      c. Finish: Satin.
      d. Length and Configuration: As indicated on drawings.
      e. Products:
         1) Bobrick B-5806 series for walls and partitions in sizes and configuration indicated on the drawings..
            (a) All partitions and compartments including urinal to receive Grab Bars..

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

A. Clothes Hook: Heavy-duty stainless steel, double-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
   1. Products:
      a. Bobrick B-682 Surface-Mounted Hat and Coat Hook.
   2. Mounted in two locations on walls in restroom area and on the back of each toilet room door: one at 40” above finished floor and another directly above at 66” above finished floor. (16) total.

2.06 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Specified in 23 04 30 - Plumbing Specialties and as indicated on the drawings.

2.07 UTILITY ROOM ACCESSORIES

A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
   1. Drying rod: Stainless steel, 1/4 inch diameter.
   2. Hooks: Two, 0.06 inch stainless steel rag hooks at shelf front.
   3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
   4. Length: Manufacturer's standard length for number of holders/hooks.
   5. Products: Bobrick B-224 x 36 for Janitor room.

B. Mounted in new Janitor Room # 13.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

D. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings. See Sheet G1.04 for mounting heights and clearances.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

1.02 REFERENCE STANDARDS

A. NFPA 10 - Standard for Portable Fire Extinguishers 2017.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers:
   1. Larsen's MP5-A Multi-purpose Dry Chemical. .

B. Fire Extinguisher Cabinets and Accessories:
   1. Larsen's Manufacturing Co; Occult O-2409 in locations indicated on drawings: www.larsensmfg.com.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   1. Class: A:B:C type.
   2. Temperature range: Minus 40 degrees F to 120 degrees F.

2.03 FIRE EXTINGUISHER CABINETS

A. Cabinet Configuration: Recessed type.
   1. Size to accommodate accessories.
   2. **Model: AL O-2409**

2.04 ACCESSORIES

A. Extinguisher Brackets: Formed steel, chrome-plated.

B. Cabinet Signage: to be determined by Owner and Architect.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

C. Modify existing recess openings as required to receive new cabinets.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Secure rigidly in place.

C. Place extinguishers in cabinets.

END OF SECTION

SECTION 12 36 69 – SOLID SURFACE WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid Surface Wall Panels for restrooms.

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.

B. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire 2019.

C. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position 2018.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

E. AWI (QCP) - Quality Certification Program Current Edition.

F. AWMAC (GIS) - Guarantee and Inspection Services Program Current Edition.

G. ISFA 2-01 - Classification and Standards for Solid Surfacing Material 2013.

H. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material 2013.

I. MIA (DSDM) - Dimensional Stone Design Manual, Version VIII 2016.

J. PS 1 - Structural Plywood 2009 (Revised 2019).

K. SEFA 2 - Installations 2010.

1.04 SUBMITTALS

A. CALGreen Submittals: Provide product data to demonstrate that adhesives, sealants, and caulks used on the project meet the requirements of the following standards:

1. TABLE 5.504.4.1 - ADHESIVE VOC LIMIT; TABLE 5.504.4.2 - SEALANT VOC LIMIT included in 01 81 13 - NTU Sustainable Design Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation including layout and joint pattern.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

F. Sustainable Design Submittal: Documentation for sustainably harvested wood-based components.

G. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

H. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

I. Installation Instructions: Manufacturer's installation instructions and recommendations.

J. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Natural Stone Institute (NSI) Accredited Natural Stone Fabricator; www.naturalstoneinstitute.org/#sle.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

C. Quality Certification:

1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.

2. Comply with AWMAC (GIS) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awmac.com/#sle.

3. Comply with WI (CCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.woodworkinstitute.com/#sle.

4. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.

5. Provide designated labels on shop drawings as required by certification program.

6. Provide designated labels on installed products as required by certification program.

7. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Quartz Panel products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside the manufacturer’s absolute limits.

PART 2 PRODUCTS

2.01 SOLID SURFACE WALL PANELS

A. Solid Surfacing Wall Panels: Solid surfacing sheet or plastic resin casting over continuous substrate.

1. Flat Sheet Thickness: 12 MM, minimum.

2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.

a. Manufacturers:

1) LX HAUSYS HIMACS, contact: Theresa Youn, tyoun@lxhausys.com

2) Or approved equal.

b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.

c. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.

d. Color and Pattern: “Lunar Sand”.

3. Installed on prepared substrate using manufacturer’s adhesive and installation instructions.

4. Use Schluter metal trims as indicated on the drawings.

2.02 MATERIALS

A. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

B. Cove Molding and Trims: Schluter

1. Color: As selected by Architect from manufacturer's full line.

C. Joint Sealant: Mildew-resistant silicone sealant, clear.

2.03 FABRICATION

A. Solid Surfacing: Fabricate wall panels up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Per manufacturer’s Instructions.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 13 31 00 - FABRIC STRUCTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Custom tensioned fabric structure, including fabric, fittings, and accessories for playground shade-sail.

1.02 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.

C. ASTM A586 - Standard Specification for Metallic-Coated Parallel and Helical Steel Wire Structural Strand 2018.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

E. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings 2020a.

F. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C 2019a.

G. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2021.

H. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films 2019.

1.03 PREINSTALLATION MEETINGS

A. Pre-installation Meeting: Convene a pre-installation meeting at least two (2) weeks before start of installation of tensioned fabric structure.

1.04 SUBMITTALS

A. See Division 01 for submittal procedures.

B. Product Data: Submit manufacturer's product data, including test reports on fabric showing compliance with specified properties.

C. Shop Drawings: Submit construction drawings including plans, elevations, details, dimensions, support steel sizing, cables and hardware, clamp/corner plates, fittings, fabric, fabric layout seams, and the following:

1. Exact interface geometry determination and definitions.

2. Coordination between fabric and structural supports

D. Samples: Submit at least 6 inch by 6 inch sample of fabric.

E. Operating and Maintenance Data: Manufacturer's instructions for fabric repair, re-tensioning cables, and cleaning fabric.

F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Handle materials so as to protect materials, coatings, and finishes during handling and installation to prevent damage or staining.

1. Handle fabric in accordance with manufacturer's instructions.

2. Use care in handling of fabric to avoid damage to fabric material and coating.

3. Do not damage, crush, or kink cables.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tensioned Fabric Structures:

1. Wholesale Shade, 168 S. Pacific Street, San Marcos, CA 92078; (760) 603-3269.

2. Or approved equal.

2.02 TENSIONED FABRIC STRUCTURES

A. Tensioned Fabric Structure: Provide a custom tensioned fabric structure consisting of fabric stretched on steel structural supports, with the following characteristics:

1. Capable of withstanding loads specified in ASCE 7 and local building code without damage or failure; for designer's information, project falls under the following design categories:

2. Capable of maintaining structural integrity in the event of a tear propagating in fabric, without endangering occupants.

3. Having a smooth uniform fabric surface with even curved edges and interfaces and without wrinkles, cuts, abrasions, stains, marks, surface defects, or seaming aberrations.

4. Configuration as indicated on drawings.

5. Made of prefabricated components ready for installation.

2.03 MATERIALS

A. Fabric: High density polyethylene (HDPE) structural mesh.

1. Warp and Weft Filaments: 100 percent round mono-filament.

2. Stretch Properties: Dimensionally stable in warp and weft.

3. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84, Class A.

4. Seams: Sufficient strength to develop 90 percent of full strength of fabric at 140 degrees F in direct tension across seam.

a. Acceptable Seams and Edges: 2-inch hem, Overlock stitched into a polyethylene rope of appropriate stretch and durability characteristics or other approved material.

5. Expected Service Life: Ten to twelve years.

6. Color: Brick. Or otherwise from manufacturer’s standard colors.

7. Manufacturers: Solamesh

B. Cables and End Fittings: Provide structural cables of same type having same modulus of elasticity.

1. Cables: Stainless steel, Type 304 or 316.

2. Structural Wire Rope Cables: Zinc-coated and pre-stretched, ASTM A603 with Single-Class, Class A coating weight throughout.

3. Thimble End Fittings: Design and install to develop a minimum of 90 percent of breaking strength of cable.

C. Mounting hardware as required by manufacturer: Shackles, Rigging Screws, Turnbuckles, D-ring thimbles, Wall plates, Clamps, and Tensioning Hardware: Stainless steel architectural finished material only.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine area to receive structure; notify Architect if area is not acceptable, and do not begin installation until unacceptable conditions have been corrected.

B. Examine foundations and anchor bolts for location and elevation; notify Architect of inaccuracies, and do not begin installation until unacceptable conditions have been corrected.

3.02 PREPARATION

A. Prepare an erection plan for all structural and fabric installation activity, including a detailed sequence of the work.

B. Prepare a clear, flat, smooth, and clean layout area on ground of sufficient size for assembly of fabric panels; prepare area adjacent to location of structure installation.

C. Check contact surfaces to remove sharp objects, dirt, grease, oil, and other causes for rips, scratching, or other damage to fabric panels during installation.

D. Use temporary ground sheets where fabric panels are to be dragged across a surface to prevent chaffing or other damage to fabric panel surface.

3.03 INSTALLATION

A. Comply with pre-established erection plan.

B. Do not undertake erection of fabric during inclement weather conditions; installer has sole responsibility to determine when conditions are safe for erection.

C. Install structure in accordance with manufacturer's instructions at location indicated on drawings.

D. Install structure in necessary sequence and with sufficient bracing to ensure stability throughout installation.

E. Install and tension fabric in accordance with manufacturer's instructions.

1. Ensure surfaces of fabric are smooth, uniform, and clean, with even curved edges and interfaces, and with no cuts, scratches, abrasions, stains, marks, blemishes, or welding irregularities.

F. Repair or replace defective or damaged materials, coatings, and finishes as directed by Architect.

3.04 ADJUSTING

A. Tension turnbuckles to achieve manufacturer required tautness.

3.05 CLEANING

A. Clean structure in accordance with fabric manufacturer's instructions.

END OF SECTION

SECTION 22 42 16 - CAST CONCRETE LAVATORY COUNTERS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Lavatories.
      a. Wall-Hung Lavatory Systems
      b. Wall-Hung, single and multi-basin, multi-station lavatories.

B. Related Requirements: Section 22 05 00 Common Work for Plumbing.

1.03 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 lavatories.
   2. Include samples of selected finish material.

B. Shop Drawings: For each counter-lavatory assembly.

1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Structural support required for custom wall-mounted counter/lavatories.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For lavatories and counters to include maintenance manuals.
   1. See additional items specified in Division 01.

PART 2 PRODUCTS

2.01 PRECAST GFRC, WALL-MOUNTED LAVATORY SYSTEM WITH INTEGRAL BASIN(S)

A. Lavatory System: Rectangular countertop deck with Integral Ramp Basin(s), precast Concrete/GFRC, wall mounted.
   1. Basis-of-Design Product: Concrete commercial restroom sink, Rear-sloping “rampsink” in custom configuration:
      a. Sonoma Cast Stone, 877 283 2400, www.sonomastone.com
      b. Or approved equal.
   2. Basin(s) and Countertop:
      a. Type: Straight front and side aprons with straight back.
      b. Number of stations: (4), see drawings.
      c. Overall Countertop size: see drawings: field measurements required, approximately 11-feet long.
      d. Basin I.D.: 15 inches deep, 5 5/8” deep.
      e. Faucet and soap dispenser Hole Punching: see plumbing drawings.
      f. Faucet and soap dispenser Hole Location: see plumbing drawings and coordinate with Owner/Architect.
      g. Drain type: Slot drain
      h. Color: to be determined from manufacturer’s standard colors.
      i. Mounting and Supports: custom wall brackets per manufacturer’s recommendations: steel tube/bracket to concrete masonry and angle at counter edge or 2” concealed extension brackets by A&M hardware, www.aandmhardware.com with steel angle at counter back and wall edge if approved by manufacturer.

3. Faucet: per plumbing drawings and schedule.
4. Waste Fittings: per plumbing drawings and schedule
   a. Standard: ASME A112.18.2/CSA B125.2.
   b. Connection and Finish: per plumbing drawings and spec.

5. Lavatory Mounting Height: per drawings and details.

PART 3 EXECUTION 3.01 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before lavatory installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install counters with integral ramp lavatories level and plumb in accordance with roughing-in drawings.

B. Install supports, affixed to building substrate, per details and manufacturer’s recommendations.

C. Install counters at handicapped/elderly mounting height for people with disabilities or the elderly, in accordance with ICC/ANSI A117.1.

D. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."

E. Seal joints between lavatories, counters, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

F. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

3.03 CONNECTIONS

A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

B. Comply with water piping requirements specified in Section 22 05 00 "Common Work for Plumbing."

C. Comply with soil and waste piping requirements specified in Section 22 05 00 "Common Work for Plumbing."

3.04 ADJUSTING

A. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.

B. Adjust water pressure at faucets to produce proper flow.

3.05 CLEANING AND PROTECTION

A. After completing installation of counter/lavatories, inspect and repair damaged finishes.

B. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.

C. Provide protective covering for installed lavatories and fittings.

D. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 42 16

SECTION 23 00 10
MECHANICAL GENERAL PROVISIONS

PART 1 – GENERAL

1.01. PROVISIONS INCLUDED

A. This section supplements each section of this Division and applies to all work specified and indicated on the Contract Documents.

B. Examine all other Sections of the specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.02. DEFINITIONS

A. Wherever the terms "shown on drawings" are used in the specifications, they shall mean "noted", "indicated", "scheduled", "detailed", or any other diagrammatic or written reference made on the drawings.

B. Wherever the term "material" is used in the specifications it will mean any "product", "equipment", "device", "assembly", or "item" required under the Contract, as indicated by trade or brand name, manufacturer's name, standard specification reference or other description.

C. The term "specification" shall mean all information contained in the bound or unbound volume, including all "Contract Documents" defined therein, except for the drawings.

D. "Piping" includes in addition to pipe or mains, all fittings, flanges, unions, valves, strainers, drains, hangers and other accessories relative to such piping.

E. “Ductwork” includes sheet metal work, dampers, air distribution devices, sound attenuators, fittings, hangers, and associated accessories.

F. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction or in crawl spaces.

G. "Exposed" means not installed underground or "concealed" as defined above.

H. "Invert Elevation" means the elevation of the inside bottom of the pipe.

1.03. CODES, STANDARDS AND REFERENCES

A. In case of conflict between the Contract Documents and the requirements of any Code or Authorities having jurisdiction, the most stringent requirements of the aforementioned shall govern for budgetary purposes. However, no work will proceed until the Owner’s Representative determines the correct method of installation.

B. Do not perform any work that does not comply with the requirements of the applicable Building Codes, State Laws, Local Ordinances, Industry Standards and Utility Company Regulations, he shall bear costs arising in correcting the deficiencies, as approved by the Owner’s Representative.

C. Applicable Codes and Standards shall include all State Laws, Local Ordinances, Utility Company Regulations and the applicable requirements of the following accepted Codes and Standards, without limiting the number, as follows:

1. California Building Code 2022
2. California Mechanical Code 2022
3. California Plumbing Code 2022
4. California Fire Code 2022
5. California Electric 2022
6. California Energy Code 2022
7. Local Ordinances, Regulations of the Local Building Department and Fire Department
8. Recommendations of the National Fire Protection Association (NFPA), latest applicable edition adopted, in general and in particular:

    a. Life Safety: NFPA 101 (2021)
    b. HVAC: NFPA 90A, 90B (2021)

9. Recommendations of ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers), including:

    a. ASHRAE 1989-90.1
    b. ANSI/ASHRAE 62-2022 Ventilation for Acceptable Indoor Air Quality

D. In these specifications, references made to the following Industry Standards and Code Bodies are intended to indicate the accepted volume or publication of the Standard. All equipment, materials and details of installation shall comply with the requirements and latest revisions of the following Bodies, as applicable:

1.	AMCA	Air Moving and Conditioning Association
2.	ANSI	American National Standards Institute
3.	ARI	American Refrigeration Institute
4.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
5.	ASME	American Society of Mechanical Engineers
6.	ASTM	American Society of Testing Materials
7.	AWS	American Welding Society
8.	FM	Factory Mutual
9.	FS	Federal Specification, U.S. Government
10.	MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
11.	NEMA	National Electrical Manufacturers Association
12.	SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
13.	UL	Underwriters' Laboratories, Inc.

E. Equipment shall be installed per manufacturer’s recommendations and requirements. Notify the Owner’s Representative in writing when they intend to deviate from manufacturer's installation guidelines.

1.04. SUBMITTAL REQUIREMENTS

A. Prepare submittals in accordance with Div.1- SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, the requirements of this section, and as noted in specific Sections of Division 15.

B. Shop drawing data shall include the following:

1. Manufacturer's model and catalog data.
2. Complete connection diagrams for each Trade.
3. Dimensions, capacities, ratings, materials and finishes.
4. Data sheet clearly marked with standard and optional factory items being proposed.

C. Each shop drawing is required to bear the review stamp of the Contractor.

1.05. QUALITY ASSURANCE

A. A Quality Control (QC) Plan shall be implemented for the Division 15 work in accordance with the provisions in Section 01400 – QUALITY CONTROL. Work of this Division shall be conducted in association with Contractor's QC Manager and QC Specialists to assure compliance with all relevant provisions contained in this Section and Section 01400, including shop drawings, product data and samples, testing and inspection, reports, quality assurance, as-built documents and warranties.

1.06. GUARANTEE REQUIREMENTS

A. Guarantee shall be in accordance with Div.1 – GUARANTEE, and the requirements of the General Conditions.

B. Manufacturers shall provide their standard guarantees for work under this Contract, unless specified otherwise. However, such guarantees shall be in addition to and not in lieu of all other liabilities which the manufacturer and Contractor may have by Law or by other provisions of the Contract Documents.

C. Upon receipt of notice from the Owner of failure of any part of the systems or equipment during the guarantee period, the affected part or parts shall be replaced by the responsible Contractor.

1.07. COORDINATION

A. Coordination of work shall be in accordance with Div.1 – COORDINATION AND MEETINGs, and the requirements of this Section.

B. General

1. Locations of piping, ductwork, conduits and equipment shall be adjusted to accommodate the new work with interferences anticipated and encountered during installation. Contractor shall determine the exact routing and location of systems prior to fabrication or installation of any system component. Accurate measurements and coordination drawings will have to be completed to verify dimensions and characteristics of the various systems' installations.

2. Lines which pitch shall have the right-of-way over those which do not pitch. For example, waste piping shall normally have the right-of-way. Lines whose elevations cannot be changed shall have the right-of-way over lines whose elevations can be changed.

3. Offsets, transitions and changes of direction shall be made as required to maintain proper headroom and pitch of sloping lines whether or not indicated on the drawings. Contractor shall provide manual air vents, trap assemblies and drains as required to effect these offsets, transitions and changes in direction, as applicable.

4. Work shall be installed in a way to permit removal (without damage to other parts) of coils, filters, control appurtenances, fan shafts and wheels, filters, belt guards, sheaves and drives and all other system components provided under this Contract requiring periodic replacement or maintenance. All piping shall be arranged in a manner to clear the openings of swinging overhead access doors, ceiling tiles and cleaning access doors in ductwork.

5. The Contract Drawings are diagrammatic only intending to show general runs and locations of piping, ductwork, equipment, terminals and specialties and not necessarily showing each required offset, detail accessory or equipment to be connected. Accurately lay out work with work specified in other sections to avoid conflicts and to obtain a neat and workmanlike installation which will afford maximum accessibility for operation, maintenance and headroom.

6. Final location of air distribution devices, thermostats, heaters, control devices and sprinkler heads shall be coordinated with the Architectural reflected ceiling plans and other Architectural details, as applicable. Offsets of ductwork, added sheet metal, elbows and flexible connections, shall be provided as required to comply with the Architectural reflected ceiling plans and installation details. Obtain approval of locations of all devices from Owner’s Representative in the field, prior to installation.

C. Coordination Drawings

1. Before materials are purchased, fabricated or work is begun, Contractor shall prepare coordination drawings for each floor/area, including buried systems/services (all-Trade-composite at 3/8" scale), showing the size and location of his equipment and lines, in the manner described herein under General Requirements.

2. Coordination drawings are for the Contractor and Owner’s Representative's use during construction and shall not be construed as shop drawings or as replacing any shop drawings. The coordination drawings, when corrected for actual "as-built" conditions, will be reviewed by the Owner’s Representative, corrected and become the Record Drawings to be submitted to the Owner for its use.

3. In addition to the regular coordination drawing review, the mechanical work will also be reviewed by the Owner’s Representative to ensure that the system and equipment arrangements are suitable to provide maintenance access and service as follows:

   a. Valves and instrumentation shall be grouped where possible and positioned in accessible locations.
   b. Location of all control/diagnostic panels on the floors and in the mechanical rooms or their designated location shall be shown and identified on the coordination drawings.

4. Prepare a complete set of computer based AutoCad 2010 (or higher) drawings at scale not less than 3/8" equals 1'-0", showing basic layout for the structure and other information as needed for preparation of Coordination Drawings. The drawings shall indicate the layout of all specialty tradework as indicated herein and shall be designated as Coordination Drawings. The Contractor can obtain a copy of the floor plans and MEP design files on disk from the Owner's Representative to assist in the preparation of Coordination Drawings. The MEP design files (in AutoCad 2010 or later) shall be made available by the Engineer for purchase by the Contractor at a flat rate of $35.00 per file (typically one file per drawing). The Contractor shall provide a minimum of two (2) weeks notice to the Architect/Engineer for preparation of the disk. A signed liability release form will be required from the Contractor prior to the release of the disk from the Owner's Representative.

5. Highlight fire rated partitions on the Coordination Drawings for appropriate coordination and as required by the Owner Fire Marshal.

6. The main paths for the installation or removal of equipment from mechanical and electrical rooms shall be clearly indicated on the Coordination Drawings.

7. Contractor shall ensure that each Subcontractor add the work of its section to the base drawings with appropriate elevations and grid dimensions. Subcontractor information shall be required for fan rooms and mechanical rooms, horizontal exits from duct shafts, crossovers and for spaces it the above ceilings where congestion of work may occur such as corridors and, where required, entire floors. Drawings shall indicate horizontal and vertical dimensions to avoid interference with structural framing, ceilings, partitions and other services. Indicate elevations relative to finish floor for bottom of ductwork and piping and conduit 6" greater in diameter.

    a. Subcontractors shall include:

        1) Plumbing.
        2) HVAC.
        3) Electrical.
        4) Sheet Metal.
        5) Drywall.
        6) Ceiling.
        7) Miscellaneous Metals.
        8) Casework.

8. Upon completing their portion of the Coordination Drawings, each Subcontractor shall sign, date and return Coordination Drawings to the Contractor. Where conflicts occur with placement of materials, the Contractor shall coordinate the available space to accommodate all work. Any resulting adjustments shall be initialed and dated by the Contractor.

9. Fabrication shall not start until Coordination Drawings have been distributed to each parties as indicated herein.

10. Format: Coordination Drawings (plans only) shall be done using CAD in AutoCAD, Release 2020 (or later), disks shall be given to the Owner's Representative for future transfer to Owner. Coordination Drawings will be used as base for as-built and record drawings.

11. The Contractor shall provide one print of each Coordination Drawing to:

    a. Each Subcontractor.
    b. Owner.
    c. Contractor.
    d. Owner's Representative (for record purposes).

12. The method used to resolve interferences not previously identified shall be as outlined above. Distribute revised Coordination Drawings to all parties listed above.

13. Coordination Drawings include:

    a. Structure.
    b. Partition/room layout, including indication of smoke and fire resistance rated partitions.
    c. Ceiling layout and heights.
    d. Light fixtures.
    e. Access panels.
    f. Ductwork, coils, air terminal boxes, registers, grilles diffusers and related equipment.
    g. HVAC Piping, valves and strainers.
    h. Smoke and fire dampers.
    i. Soil, waste and vent piping.
    j. Rainwater and storm piping.
    k. Major water.
    l. Major electrical conduit runs, panelboards, feeder conduit and racks of branch conduit. Motor control centers, starters and disconnects.
    m. Seismic bracing.
    n. Equipment located above finished ceiling requiring access for maintenance and service. In locations where acoustical lay-in ceilings occur indicate areas in which the required access area may be greater than the suspected grid systems.

D. The Owner's Representative's response to requests for information (RFI's) generated by the Contractor shall be distributed to each affected trade as if this information was contained in the original contract documents.

1.08. AS-BUILT DOCUMENTS

A. As-Built documents shall be in accordance with Div.1 – CONTRACT CLOSEOUT, and the requirements of this Section.

B. Contractor shall indicate progress by coloring-in various pipes, ducts and associated appurtenances exactly as they are erected. This process shall incorporate both the changes and other deviations from the original drawings whether resulting from job conditions encountered or other causes.

C. The marked-up and colored-up prints will be used as a guide for determining the progress of the work installed. They shall be inspected periodically by the Owner's Representative and Owner's representatives and they shall be corrected if found either inaccurate or incomplete. Marked up drawings shall include all flow diagrams, schedules, details and control diagrams.

D. Contractor and applicable Subcontractor shall meet at a minimum on a monthly basis, with the Owner's Representative to transfer the information from HVAC, Plumbing, Fire Protection, marked-up and colored-up prints to a set which will become the basis for preparation of as-built drawings.

E. Upon completion of the project, the Contractor shall submit his marked-up drawings to the Owner's Representative for review and comment. After the Owner's Representative reviews and comments on this set of documents, the Contractor shall prepare as-built drawings on CAD using AutoCad Version 2020 (or later). When the work is completed, the Contractor shall provide 2 hard copies and one (1) CD-Rom of all "As-Built" drawings, to the Owner's Representative for submittal to the Owner. The Contractor shall bear all costs of producing the CAD "As-Built" drawings, providing all necessary drawing changes and printing the reproducible drawings for the work under his charge.

1.09. EQUIPMENT AND MATERIALS

A. Equipment and materials manufacturers shall be as specified for each product in each section. Equal product substitutions shall be allowed only when submitted and deemed acceptable in accordance with Div.1 – PRODUCT OPTIONS AND SUBSTITUTIONS.

B. Equipment and materials shall be delivered to the site and stored in original sealed containers, suitably sheltered from the elements, but readily accessible for inspection by the Owner's Representative until installed. Items subject to moisture damage such as controls and filters shall be stored in dry, heated spaces.

C. Contractor shall have his equipment tightly covered and protected against dirt, water and chemical or mechanical injury and theft. At the completion of the work, equipment and materials shall be cleaned, polished thoroughly and turned over the Owner in a condition satisfactory to the Owner's Representative. Damage or defects developing before acceptance of the work shall be made good at the Contractor's expense.

D. Make necessary field measurements to ascertain space requirements, for equipment and connections to be provided and shall furnish and install such sizes and shapes of equipment to allow for the final installation to conform to the drawings and specifications.

E. Manufacturers' directions shall be followed completely in the delivery, storage, protection and installation of any equipment. Promptly notify the Owner's Representative in writing of any conflict between any requirements of the Contract Documents and the manufacturer's directions and obtain the Owner's Representative's written instructions before proceeding with the work. The Contractor shall bear all costs arising in correcting any deficiencies that should arise due to work that does not comply with the manufacturer's directions or written instructions from the Owner's Representative.

F. Where equipment of the acceptable manufacturers requires different arrangement or connections from those shown, install the equipment to operate properly and in harmony with the original intent of the drawings and specifications. As approved by the Owner's Representative, submit drawings showing the proposed installation. If the proposed installation is approved, the Contractor shall make all necessary changes including location of rough-in connections, electrical requirements, piping, supports, insulation, etc. Changes shall be made at no increase in the Contract amount or additional cost to the Owner.

G. Equipment of one type (such as valves, fans, air handling units, air terminals, plumbing fixtures, sprinkler heads, etc.), shall be the product of one manufacturer.

H. Equipment pre-purchased on behalf of the Owner or by the Owner, if assigned to the Contractor, shall be received, inspected and installed, as if it was purchased by the Contractor.

1.010. USE OF PREMISES

A. Confine tools, equipment, materials and construction to the limits indicated on the drawings and directed by the Owner's Representative.

B. The responsibility for the safe working conditions at the site shall remain with the Contractor. The Owner and Owner's Representative shall not be deemed to have any responsibility or liability in connection therewith.

C. Air handling unit shall not be used for storage of materials. The Contractor will be responsible for securing, locking and maintaining the equipment clean.

1.011. PROTECTION

A. Materials such as valves, fittings, piping, ductwork, shall be properly protected and each ductwork and piping opening shall be temporarily closed, so to prevent obstruction and damage. Contractor shall take precautions to protect materials from damage and theft.

B. Furnish, place and maintain proper safety guards for the prevention of accidents that might be caused by the workmanship, materials, equipment or electrical systems provided under his Contract.

C. PARTS LIST AND INSTRUCTIONS FOR OPERATION AND MAINTENANCE

D. Thoroughly instruct the representative of the Owner, to the complete satisfaction of the Owner's Representative, in the proper operation of all systems and equipment provided by the Contractor. Make arrangements, via the Owner's Representative as to whom the instructions are to be given in the operation of the basic and auxiliary systems and the periods of time in which they are to be given. The Owner's Representative shall be completely satisfied that the representative of the Owner has been thoroughly and completely instructed in the proper operation of all systems and equipment before final payment is made. If the Owner's Representative determines that complete and thorough instructions have not been given by the Contractor to the Owner's representative, then the Contractor shall be directed by the Owner's Representative to provide whatever instructions are necessary until the intent of this paragraph of the specification has been complied with.

E. Submit to the Owner's Representative for review, a total of (6) typed sets, bound neatly in loose-leaf binders, of maintenance and operating instructions for the installation, operation, care and maintenance of equipment and systems. Data and literature furnished shall be specific for the make and model of the equipment furnished. General non-specific catalog data will not be acceptable. Information shall indicate possible problems with equipment and suggested corrective action. The manuals shall be indexed for each type of equipment. Each section such as fans, valves, plumbing fixtures, hot water heaters, boilers, air handling units, etc., shall be clearly divided from the other sections. A sub-index for each section shall also be provided. The methodology of

setting-up the manuals shall be submitted to the Owner's Representative for approval prior to final submission of manuals.

F. The instructions shall contain information deemed necessary by the Owner's Representative and shall include the following:

1. Instructional classes on equipment and systems operation for Owner's representative and maintenance personnel, by engineering staff of the Mechanical Contractor. Minimum of 48 hours of instruction for minimum of (2) people. Instruction shall include:

   a. Explanation of manual and its use.
   b. Summary description of the HVAC, Plumbing and Fire Protection.
   c. Purpose of systems.

2. System

   a. Detailed description of each system.
   b. Illustrations, schematics, block diagrams, catalog cuts and other exhibits.

3. Operations

   a. Complete detailed, step-by-step, sequential description of each phase of operation for all portions of the systems, including start-up, shutdown, adjusting and balancing. Include posted instruction charts.

4. Maintenance

   a. Parts list and part numbers.
   b. Maintenance, lubrication and replacement charts and manufacturer's recommendations for preventive maintenance, as applicable to his work.
   c. Troubleshooting charts for systems and components.
   d. Valve chart.
   e. Air and water balance reports.

G. MANUFACTURER'S REPRESENTATIVE AND EQUIPMENT COMMISSIONING

H. Provide, at appropriate time or as approved by the Owner's Representative, the on-site services of a competent factory trained Engineer or authorized representative of particular manufacturer of equipment provided under his Contract, (such as for the air handling units, air conditioning units, building HVAC DDC control system, and domestic hot water heaters) to instruct the Owner, inspect, adjust and place in proper operating condition each item provided by him.

I. Commission and set in operating condition all major equipment and systems, in the presence of the applicable equipment manufacturer's representatives, the Owner and Owner's Representative. In no case will major systems and equipment be commissioned without the assistance or presence of the equipment manufacturers.

J. A written report shall be issued by the particular equipment manufacturer and the Contractor summarizing the results of the commissioning and performance of each system for the Owner's Representative's record. No additional compensation will be allowed for such services.

K. Prepare and submit to the Owner's Representative for acceptance, a schedule of anticipated system commissioning. No system shall be commissioned without prior acceptance of the schedule by the Owner's Representative. No systems shall be commissioned prior to submittal and acceptance of Operation and Maintenance Manuals.

1.012. CONNECTIONS TO EQUIPMENT

A. Provide all duct and pipe connections, condensate traps, drains, overflows, relief valves, waste connections, vents and power connections, to make equipment operable, specified in other Sections of the specifications, as shown on the Architectural or other trade drawings and herein specified, including final connections to equipment to result in a complete system, fully operational. Coordinate location of equipment with Owner's Representative. Obtain installation diagrams and methods of installation of equipment from manufacturers. Follow instructions strictly. If additional information is required, obtain same from Owner's Representative. If equipment is indicated on the Architectural drawings, it shall also be construed and understood by the Contractor to be constructed or installed as shown for similar equipment on the HVAC, Plumbing and drawings and shall be fully serviced and connected at no extra cost to the Owner.

1.013. ELECTRICAL ROOM REQUIREMENTS

A. Do not install piping, ductwork or equipment in or through electrical rooms, transformer rooms, electrical closets, telephone rooms or elevator machine rooms, unless piping, ductwork or equipment is intended to serve these rooms. If this requirement is violated the Contractor shall remove and/or relocate items as required at his expense and to the satisfaction of the Owner's Representative.

1.014. HOISTING EQUIPMENT, MACHINERY AND STAGING

A. Hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the work under this Contract shall be furnished, installed, operated and maintained in safe condition by the Contractor for material and equipment delivered to the designated hoisting area. All costs for hoisting operating services shall be borne by the Contractor for all equipment and work.

B. Staging, exterior and interior shall be furnished and erected by the Contractor and maintained in safe condition by him for proper execution of all work.

1.015. PHASING AND MAINTAINING EXISTING SERVICES

A. During the execution of the work, utility systems in the existing areas where new work and connections are scheduled to be made shall be performed as indicated on the drawings, as required by the job conditions and as determined by the Owner's Representative to facilitate the installation of the new systems and completion of this Contract. The Owner will require the continuous operation of all existing systems, while new tie-ins are being performed. Refer to Div.1 – TEMPORARY UTILITIES, for service continuity requirements.

B. Prior to any new tie-in work, consult the drawings and arrange a conference with the Owner's Representative in the field to inspect each of the services scheduled to make new connections. Give notice to each party, with a minimum of fifteen (15) working days in advance.

C. Draining of existing systems, filling and venting required to remove and relocate existing piping systems shall be included and provided as required to perform the various equipment or piping relocations or new tie-ins.

D. New utilities shall be installed and completely commissioned prior to occupancy. Coordinate requirements for temporary heat or rerouting of existing services as required to accomplish the construction schedule.

1.016. ELECTRICAL WORK AND BUILDING AUTOMATION SYSTEM CONTROL WIRING

A. Provide power wiring (480V/208V/120V) as specified in Electrical Division, to all equipment provided under the Division 23 sections of the Specifications.

B. Control wiring shall be installed in accordance with the respective equipment manufacturer requirements.

C. Conduit and wiring provided under Electrical Division shall be installed in accordance with the requirements of Electrical Division.

D. Provide control and interlock wiring for all systems provided under Divisions 23 and Electrical Division.

E. Factory furnished packaged or skid mounted equipment shall be equipped with individual fused disconnect switches for each motor and electric load. Disconnects shall be in accordance with the requirements of Electrical Division.

F. Electrical equipment and components shall be designed to exceed the minimum short circuit ratings indicated in the electrical plans and Electrical Division specifications by a minimum of 25%.

1.017. SYSTEM ACCEPTANCE PROCEDURE/BUILDING SYSTEM COMMISSIONING

A. Demonstrate each system completely to the Owner's satisfaction.

B. Refer to General Conditions and Division 18 -Commissioning for additional requirements.

PART 2 – PRODUCTS

2.01 NOT USED

PART 3 – EXECUTION

3.01 CUTTING AND PATCHING

A. Cutting and patching shall be provided in accordance with Division 1, and the requirements of this Section.

B. Contractor shall be responsible for core drilling, as required for work under this Contract, but in no case shall he cut into any structural elements without the written approval of the Owner's Representative.

C. Cutting, rough patching and finish patching, shall be provided under this Contract.

3.02 CONCRETE WORK

A. Concrete and masonry equipment bases and pads, shall be provided as specified in other Division.

B. Contractor shall coordinate the size and location of mechanical equipment pads, anchor bolts and sleeves with the work specified in Division 3.

C. Contractor shall coordinate the requirements for concrete inertia bases with the work specified in other Division.

3.03 TOUCH-UP PAINTING

A. Contractor shall thoroughly clean equipment and systems from rust, splatters and other foreign matter or discoloration, leaving every part of each system in an acceptable prime condition. Contractor shall refinish and restore to the original condition all equipment and piping which has sustained damage to the manufacturer's prime and finish coats of paint and/or enamel.

3.04 WATERPROOFING, FLASHING AND COUNTERFLASHING

A. Unless specifically indicated otherwise on the drawings, Contractor shall provide flashing and waterproofing of piping, ductwork and equipment, which pierce roofs, walls and other weather barrier surfaces.

B. Work shall be performed in a workmanlike manner to ensure weatherproof installation. Any leaks developed due to Contractor's work shall be repaired at his expense, to the satisfaction of the Owner’s Representative, and shall be in conformance with the roofing manufacturer’s warranty/guarantee requirements.

C. Pipes passing through slabs shall have the sleeve extended above floors as hereinbefore specified to retain water and the space between the pipe and sleeve filled with rope wool. The top and the bottom shall be sealed with monolastic caulking compound. Pipes passing through rated floor slabs shall be firestopped with UL listed firestopping system.

3.05 AIR VENTING AND DRAINAGE

A. Grade all piping for drainage through equipment or through accessible drain valves so that system can be conveniently freed of water by gravity flow. All drain valves shall be ball valves, (minimum size 1/4"), or larger where shown or required by the service.

B. All high points in closed water piping systems shall be relieved of air through accessible manual vents on the high points of the pipe lines and at the equipment. Vent valves on piping and equipment shall be 1/2" ball valves with chains and caps and with discharge pipes to convenient points for catching discharge, and shall meet the manufacturer’s installation requirements.

C. Provide drains from air handling units and from air intake and other intake and exhaust plenums with traps. Traps shall be a minimum of 4", unless the static pressure requires additional trap depth. Discharge drains to nearest floor drain, janitor sink, roof or outdoors, as indicated on the drawings and approved by Owner’s Representative.

END OF SECTION

SECTION 23 00 50
BASIC MECHANICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Furnish and install all work associated with the HVAC, Plumbing and systems as shown on the drawings and specified herein.

B. Products specified under this Section include:

1. Access doors.
2. Sleeves and escutcheons.
3. Miscellaneous iron and steel.

C. Refer to Part 3 for acceptance testing and installation criteria.

1.02 RELATED SECTIONS

A. Examine drawings and other sections of the specifications for requirements which affect work under this Section, including the following:

Mechanical General Provisions.

1.03 REFERENCES

A. None.

1.04 SUBMITTALS

A. Refer to Div.1 – SUBMITTALS.

1.05 QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL

B. Qualifications

1. Manufacturer: Company specializing in manufacturing of products specified in this section, with documented experience of more than five (5) years.

2. Installer: Company specializing in executing the scope of work specified in this section, with documented experience of more than five (5) years.

PART 2 – PRODUCTS

2.01 ACCESS DOORS

A. Access doors shall be furnished and installed by the Contractor. Coordinate requirements with Division 8 of the Specification. Access doors shall be installed where valves, switches, dampers, controllers or other similar equipment are installed above GWB ceilings or behind walls or anywhere they become inaccessible for inspection, maintenance or servicing. Access doors shall be 24" by 24" in general and a minimum of 10" by 18", except plumbing valve access doors in tile areas, shall be 8” x 8” or 12” x 12” to match tile dimensions. Access doors shall be sized to suit the access requirement to service the equipment and shall be located individually and in a manner approved by the Owner’s Representative and to meet requirements specified here and elsewhere, for specific applications.

B. Access doors shall be set square and flush. Particular attention shall be exercised in the selection of doors for masonry walls in order that frame sizes used will match the courses of brick or block. Where possible, access panels shall be located in closets, storage rooms and/or other non-public areas and shall be constructed in a workmanlike manner. Doors shall be positioned so that the junction can be easily reached. Where access panels are required in corridors, lobbies or other habitable areas, they will be located as approved by the Owner’s Representative.

C. Access doors shall be constructed of steel with primer coat of rust inhibitive paint and shall have continuous piano hinge, as manufactured by Inland Steel Products Milcor, Miami, Walsh-Hannon or equal. Door locks shall be screwdriver operated with stainless steel cam and studs.

1. Gypsum wallboard (GWB) ceilings: Coordinate type of access panels with Division 8.
2. Masonry non-rated walls: Style M with 16 gauge frame, 14 gauge panel and flush screwdriver operated cam locks.
3. Masonry fire rated walls and at shafts: Fire rated with UL, 1.5-hour "B" rating, 16 gauge frame, 20 gauge sandwich type insulated panel, self-latching lock having interior release mechanism and key operated cylinder lock keyed as approved by the Owner’s Representative.
4. For access doors larger than 16" in either direction, provide (2) lock sets.

2.02 SLEEVES AND ESCUTCHEONS

A. Where piping and/or ductwork pass through walls or floors, provide and set individual sleeves for each pipe or duct and other work, as necessary for passage of pipes and ducts. Sleeves shall be of sufficient size to provide 1/2" air space around the pipe or duct passing through (including insulation where pipes or ducts are insulated). Contractor shall be responsible for the exact location of sleeves and shall coordinate all requirements for piping and ductwork sleeves.

B. Contractor shall determine the required inside diameter of each individual wall opening or sleeve before ordering, fabrication or installation of equipment.

C. Sleeves and inserts shall not be used in the building, where their use would impair the strength or construction features of the building. Elimination of sleeves must be approved by the Owner’s Representative.

D. Provide chrome plated brass escutcheons with set screw for exposed piping, except in mechanical rooms. In this area use plain brass or cast iron escutcheons suitable for painting. Escutcheons shall be sized to fit the bare pipe or insulation in a snug and neat manner. They shall be of sufficient size to cover sleeved openings for the pipes and of sufficient depth to cover sleeves projecting above floors. Escutcheons shall be as manufactured by Beaton & Caldwell, Dearborn Brass, Grinnell, or equal.

E. Pipe or duct sleeves shall be made of Schedule 40 pipe, 20 gauge galvanized steel or 16 gauge steel as follows:

1. Sleeves on pipe passing through masonry or concrete construction shall be Schedule 40 pipe.
2. Sleeves on ducts passing through concrete construction shall be 20 gauge steel unless required otherwise by item 4. below.
3. Sleeves on pipes or ducts passing through drywall construction shall be 20 gauge galvanized steel.
4. Sleeves on pipes or ducts passing through fire rated partitions shall be 16 gauge galvanized steel.

F. Pipe or duct sleeves shall be set as follows:

1. Set sleeves 1" above finish floor, (except set sleeves, 6" above finish floor at penthouses or mechanical rooms and 6” above finished roof) and flush on each side of walls.
2. Sleeves shall be set securely in place before concrete is poured when placed in concrete construction.
3. Provide sheet metal sleeves for duct penetrations and cover penetrations with sheet metal plates after ductwork has been installed through walls/floors.

G. Except as otherwise specified, underground piping passing through exterior walls or foundation slabs on grade shall have penetration closures of the modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall opening. Links shall be loosely assembled with bolts to form a continuous belt around the pipe and with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide an absolutely watertight seal between the pipe and wall, reducing chances of cathodic reaction between these members. Contractor shall determine the required inside diameter of each individual wall opening or sleeve before ordering, fabrication or installation. The inside diameter of the wall opening shall be sized to fit the pipe and ensure a watertight joint. The assembly shall be coordinated with the installation requirements of the waterproofing/stopping system. Where applicable, when installing seals, take into account the pipe O.D. if non-standard due to coating or jacketing.

H. Refer to other Sections for Through Penetration Firestop System.

2.03 MISCELLANEOUS IRON AND STEEL

A. Provide all primary and secondary steel supports and hangers as shown on the drawings and as required to support equipment, ductwork, piping, exhaust fans, or any other materials provided under the work of this Section.

B. The work of this Section includes the following items:

1. Hangers, brackets, angle irons or rods required for the support and protection of equipment and system.
2. Field prime painting of galvanized steel and field finish painting, as directed by the Owner's Representative.
3. Seismic restraint elements and attachments to structure.

C. Submittals for General Miscellaneous Items

1. Submit Shop Drawings of miscellaneous metal items to Owner's Representative for approval, showing sizes and thicknesses of all members, types of materials, methods of connection and assembly, complete dimensions, clearances, anchorage, relationship to surrounding work specified in other sections, shop paint, and other pertinent details of fabrication and installation.
2. Submit duplicate samples of materials to be furnished under this Section if, and in size and form, requested by Owner's Representative.

D. Engage the services of a Professional Engineer registered in the State of California to prepare complete fabrication details and structural design computations based on the requirements of the Contract Documents. The fabrication details and structural design computations, with the Engineer's seal affixed thereto, shall be submitted to the Owner's Representative for review. The structural design computations shall provide a complete structural analysis, including anchors and fastening devices, and shall certify as to conformation with the California Building Code and the Seismic Restraint requirements of other Sections.

E. Do not order materials or begin fabrication until Owner's Representative's approval of submittals has been obtained.

F. In addition to the governing laws and codes, the following Specifications and Codes form a part of this Specification:

1. American Iron and Steel Institute applicable standards.
2. American Institute of Steel Construction "Code of Standard Practice for Steel Buildings and Bridges" and "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings".
3. American Welding Society Code: Standard Code for Arc and Gas Welding in Building Construction.

G. Provide anchors, bolts, sockets, sleeves, and other parts required for securing each item of work of this Section to the construction, including furnishing required insets and sleeves for work specified in other sections.

1. Exposed fastenings shall be of the same material and finish as the metal to which applied, unless otherwise noted.
2. Welding rods shall conform to AWS Standards and the recommendation of the welding rod manufacturer.
3. Shop primer for other ferrous surfaces shall be a high-quality, lead-free, rust-inhibitive primer, Tnemec No. 10-99 Metal Primer or equivalent by Devoe and Raynolds Co., Carboline, or equal.

H. Metal surfaces shall be clean and free from mill scale, flake, rust and rust pitting. Metal work shall be well formed and finished to required shape and size, true to details, with straight, sharp lines and angles and smooth surfaces. Curved work shall be true radii. Exposed sheared edges shall be eased.

I. Weld permanent connections. Welds shall be continuous on exposed surfaces and where required for strength on concealed surfaces. Exposed welds shall be ground flush and smooth, with voids filled with metallic filling compound (metallic filling compound not permitted on surfaces to receive hot-dip galvanizing). Tack-welding will not be permitted unless specifically called for. Do not use screws or bolts where they can be avoided. Where used, heads shall be countersunk, screwed up tight, and threads nicked to prevent loosening.

J. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Joints exposed to weather shall be formed to exclude water.

K. Provide all cutting, punching, drilling and tapping required for attachment of anchor bolts and other hardware and for attachment of work specified in other Section. Cutting, punching and drilling shall be done prior to hot-dip galvanizing of the various components.

L. Live loads shall be not less than the minimum required by law. Where specific live load are not set forth in the laws and codes applicable to this work, and are not given on the Drawings or in this Specification, designs shall be such as to support the live loads which may normally be imposed without failure, without deflection of more than 1/360 of length of any member, and without permanent deformation, with a factor of safety of not less than 2 1/2 to 1.

M. Miscellaneous Items

1. Carefully review Drawings for miscellaneous metal items required but not specifically listed above, such as miscellaneous steel clip angles, miscellaneous steel bracketing, and other miscellaneous metal items as indicated on the Drawings, reasonably implied therefrom, or reasonably necessary for the thorough completion of the work.
2. Provide rigid and secure anchorage of all components whether or not specifically described in complete detail on the Drawings.

PART 3 – EXECUTION

3.01 INSTALLATION – GENERAL

A. Install products and materials in accordance with the manufacturer’s recommendations, Contract Drawings and reviewed submittals.

3.02 MISCELLANEOUS METALS INSTALLATION

A. Materials shall be carefully handled and stored under cover in manner to prevent deformation and damage to the materials and to shop finishes, and to prevent rusting and the accumulation of foreign matter on the metal work. Work shall be repaired and cleaned prior to erection.

B. Work shall be erected square, plumb and true, accurately fitted, and with the tight joints and intersections. Anchors, inserts and other members to be set in concrete or masonry

shall be furnished loose to be built-into concrete and masonry as the work progresses. Later cutting or drilling shall be avoided wherever possible.

C. Metal work shall be rigidly braced and secured to surrounding construction, and shall be tight and free of rattle, vibration, or noticeable deflection after installed.

D. Where members, other than expansion bolts or inserts, are fastened into concrete, set such members in holes formed as specified below, and secure permanently in place by installation of proprietary-type expanding grout manufactured specifically for such purpose, used strictly in accordance with manufacturer's directions. Holes to receive members shall be formed with galvanized sheetmetal sleeves, expanded polystyrene foam, or other approved method to provide at least 1/2 inch clearance around entire perimeter. At exposed applications, hold expanding grout back 1/2 inch from finish surface and fill voids with Portland cement grout to match color and texture of surrounding concrete surface.

E. Where dissimilar metals are to come into contact with one another, isolate by application of a heavy coating of bituminous paint on contact surfaces in addition to shop coat specified above. Do not permit the bituminous paint in any way to remain on surfaces to be exposed or to receive sealant.

F. Ungalvanized ferrous metals under this Section shall be given a shop coat of rust inhibitive primer of type specified above.

1. Immediately before shop painting, remove rust, loose mill scale, dirt, weld flux, weld spatter, and other foreign material with wire brushes and/or steel scrapers. Power tool clean in accordance with SSPC SP-3 (Power Tool Cleaning). Remove grease with oil by use of solvent recommended by paint manufacturer. Sandpaper exposed surfaces as required to produce smooth, even finishes.
2. Apply paint by spray process in strict accordance with manufacturer's printed instructions to uniform thickness(es) recommended by manufacturer. Apply thoroughly and evenly and work well into corners and joints taking care to avoid sags and runs.
3. Do not paint surfaces to be embedded in concrete, or to be welded in the field. After field welds are complete, grind smooth and flush, thoroughly clean and then apply specified primer over unprimed metal in the field by brush roller.
4. After erection, sand smooth and retouch portions of the shop coats chipped or damaged during erection, and coat field welds and connections with primer equivalent to that used for the shop coat.

END OF SECTION

SECTION 23 00 60
HANGERS AND SUPPORTS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Furnish and install hangers, supports and assemblies for the mechanical systems. This shall include piping, ducts and equipment specified in this Division and as shown on the drawings

B. In addition to special hangers and supports specified elsewhere in this Section and shown on the drawings for ducts, piping and equipment, furnish and install safe and substantial means of support for the mechanical systems. Shop drawings shall be submitted for review and approval for all supports.

C. Materials shall be new and manufactured for the specific purpose of supporting systems, equipment, pipes, ducts, conduits and accessories.

D. Provide seismic support for pipe and ducts per SMACNA Seismic Restraints Manual guidelines for Mechanical systems latest edition and the California Building Code 2016

E. Refer to Part 3 for installation requirements.

1.02 RELATED SECTIONS

A. Examine drawings and other Sections of the Specifications for requirements which affect work under this Section, including the following sections:

1. 23 00 10 – Mechanical General Provisions
2. 23 00 50 – Basic Mechanical Materials and Methods
3. 23 04 11 – Water Distribution Piping
4. 23 04 19 - Natural Gas Piping
5. 23 04 20 - Drainage and Vent Piping
6. 23 08 91 - Ductwork

1.03 REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as following:

1. ASME B31.9 – Building Services Piping, The American Society of Mechanical Engineers; 1998 (with 1991 Agenda).
2. ASHRAE 1992 Systems and Equipment Handbook, Chapter 42.
3. ASTM F 708 – Standard Practice for Design and Installation of Rigid Pipe Hangers; 1992.
4. MSS SP-58 – Pipe Hangers and Supports – Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry; 1993.
5. MSS SP-69 – Pipe Hangers and Supports – Selection and Application; Manufacturers Standardization Society of the Valve Fittings Industry; 1991.
6. MSS SP-89 – Pipe Hangers and Supports – Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry; 1991.
7. NFPA-13 – Installation of Sprinkler Systems; 1996.
8. SMACNA Seismic Restraint Guidelines.

1.04 SUBMITTALS

A. Refer to Div.1 – SUBMITTALS.

B. Brackets and hangers shall be submitted for review. Include the method of hanging and supporting piping, ductwork and equipment.

C.

D. The Owner's Representative is to be notified when the first bracket is assembled so that the installation can be inspected in the field.

E.

F. Provide location of inserts to be used for hanging ductwork, piping and equipment and the weight of components (including water weight).

1.05 QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL.

B. Qualifications

1. Manufacturer: Company specializing in manufacturing of products specified in this section, with documented experience of more than ten (10) years.

2. Installer: Company specializing in executing the scope of work specified in this section, with documented experience of more than five (5) years.

3. Welders: Certified in accordance with ASME. Provide certificate of compliance from authority having jurisdiction, indicating approval of welders.

C. Quality Standards

1. Installation: Conform to ASME B31.9 code for installation of piping system and ASTM F708 for design and installation of pipe hangers..

2. Welding Materials and Procedures: Conform to ASME (BPV IX) and applicable state labor regulations.

3. Piping shall be hung to true alignment, using appropriate and substantial hanger arrangements. Wire and strap hangers will not be permitted. Hangers shall be located so that piping and hangers will be clear of other piping, hangers, conduits, lighting and other obstructions.

4. The hanging and supporting of piping and equipment shall conform to recommendations of the manufacturers of same and American National Standard, ANSI/MSS SP-58 and SP-69 latest edition, except where requirements of this specification exceed the above referenced Standards.

5. Ductwork shall be supported per SMACNA Guidelines.

PART 2 – PRODUCTS

2.01 **HANGERS AND SUPPORTS**

A. Pipe supports shall be of type and figure number as specified.

B. Manufacturers shall be B-Line, Carpenter & Patterson, Grinnell, or equal. Products of a single manufacturer are listed below to establish minimum standards.

C. Bracket assemblies for supporting piping are to be fabricated by welding and irregular surfaces are to be smoothed up by grinding and approved by the Owner's Representative. Shop drawings shall be submitted for review for each type bracket. The Owner's Representative is to be notified when the first bracket is assembled so that installation can be inspected in the field. Exposed hangers, supports and brackets are to be given (2) coats of rust resistant paint of the color as selected by the Owner's Representative. Additionally, provide for Owner's Representative's review, the following:

1. Location of inserts to be used for hanging ductwork and piping where applicable and the weight of such pipe or equipment to be hung, including the weight of water, valves and insulation.

2. Method of hanging and support of piping, ducts and other equipment.

D. Pipe supports shall be of type and arrangement as hereinafter specified. They shall be so arranged as to prevent excessive bending stresses between supports.

E. Bracket clamp and rod sizes indicated in this specification are minimum sizes only. Contractor shall be responsible for structural integrity of all supports. Structural hanging materials shall have a safety factor of (5) built in. Beam clamps shall be 2-sided steel clamps, with listed safety straps, designed to firmly attach to the flange of the beam with the load directed downward on the centerline of the beam web. Beam clamps shall be B-Line #B3055, or equal.

F. Other forms of hangers and supports shall be used to accommodate special or unusual job conditions or conditions not covered herein, subject to the approval of the Owner's Representative. When special conditions require the use of concrete inserts which are not "built in", such inserts may be used in locations approved by the Owner's Representative and shall be Phillips "Red Head", Hilti, or equal. Explosive powder studs or detonator assisted studs or anchors will not be permitted.

G. Pipes shall be hung free of dependence on pipe sleeves for support.

H. Auxiliary steel required for pipe, duct and equipment supports shall be furnished and installed as specified in Division 15.

I. Threaded pipe, chains, wire and perforated straps will not be accepted. No piping shall be supported from ductwork, conduit or other piping. System components and equipment shall be independently supported. Stagger and distribute hangers on parallel piping to avoid overloading of existing construction.

J. Hangers and supports used for systems exposed to weather shall be hot dipped galvanized in accordance with ASTM A153-73 or A123. Rods and nuts shall be electro-galvanized.

K. Horizontal water, drain, waste, and vent piping shall be hung with clevis steel hangers, B-Line #B3100 or equal. Groups of pipes in the same horizontal plane and with the same pitch may be supported on B-Line #3160 or equal gang hangers. Wall brackets shall be B-Line #B3066 and #B3077 or equal. Install hangers on both sides of each hubless coupling on straight runs of cast iron pipe.

L. Unless otherwise noted, maximum pipe hanger spacing shall not exceed the recommendations of the pipe manufacturer and the following:

1. For plastic or polypropylene pipe: 4’-0” o.c.
2. For 1/2" copper and steel pipe: 4'-0" o.c.
3. For pipe 3/4" to 1 1/2": 8'-0" o.c.
4. For pipe 2" to 8": 10'-0" o.c.
5. In addition, hangers shall be installed within 2'-0" of each change in direction and on each side of valves 3" in size and up.

M. Hanger rods shall be of steel and not less in diameter than:

1. For pipe 2" and under: 3/8"
2. For pipe 2 1/2" and 3": 1/2"
3. For pipe 4" and 5": 5/8"
4. For pipe 6" 3/4"

N. Vertical piping shall be supported with B-Line #B3773 or equal steel riser clamps. Such clamps on copper tubing shall be applied over couplings only.

O. Pipes suspended at an elbow shall be hung using B-Line #B3100 or equal forged steel clevis.

P. Drop rods for hangers may be used wherever possible and shall be installed prior to slabs being poured. Drop rod details shall be submitted to the Owner’s Representative for review.

Q. Hangers used on uninsulated copper plumbing pipe shall be felt lined.

PART 3 –EXECUTION

3.01 PREPARATION

A. Hangers, rods and supports shall receive two (2) coats of rust inhibitive paint.

B. Provide inserts for placement in concrete formwork.

C. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

D. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.

E. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

3.02 INSTALLATION

A. Hangers and Supports

1. Install in accordance with ASME B31.9, ASTM F 708, or MSS SP-89 or NFPA-13.

2. Support piping, ductwork and equipment as specified under Part 2.

3. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.

4. Place hangers with 24 inches of each horizontal elbow and on each side of valves 3” in size and up.

5. User hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.

6. Where several pipes can be installed in parallel and at the pitch and same elevation, provide multiple or trapeze hangers. Refrigerant and hot water piping shall not be installed together on trapeze hangers.

7. Prime coat (2 coats rust inhibitive paint) exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

B. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 15083.

C. Provide access where valves, dampers and controllers are not exposed. (Coordinate size and location of access doors).

D. Slope piping and arrange systems to drain at low points. Use eccentric reducers on horizontal hydronic piping to maintain top of pipe level.

E. Where pipe support members are welded to structural building framing, scrape, brush clean and apply two coats of zinc rich primer to welds.

F. Prepare exposed unfinished pipe, fittings, supports, and accessories, ready for finish painting. Refer to Section Div. 9 – Painting.

END OF SECTION

SECTION 23 00 75
MECHANICAL IDENTIFICATION

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Furnish and install name plates, valve tags, stencils and pipe markers on Mechanical equipment, piping and ductwork installed under this Division.

B. Indicate valve tag numbers on Record Drawings and submit framed under glass Valve Tag Charts including valve service and location.

1.02 RELATED SECTIONS

A. Examine drawings and other Sections of the Specifications for requirements which affect work under this Section, including the following:

1. 23 0010 – Mechanical General Provisions
2. 23 00 50 – Basic Mechanical Materials and Methods

1.03 REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as follows:

1. ASME/ANSI A 13.1 – Scheme for Identification of Piping Systems; The American Society of Mechanical Engineers; 1981 (Reapproved 1985).

1.04 SUBMITTALS

A. Refer to Div.1 – SUBMITTALS.

B. Product Data: Submit full size samples and product description including materials, attachment methods, color coding and lettering sizes. Samples will be returned to the Contractor after review.

1.05 QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL.

B. Qualifications

1. Manufacturer: Company specializing in manufacturing of products specified in this section, with documented experience of more than five (5) years.
2. Installer: Company specializing in performing scope of work specified in this section with documented experience of more than five (5) years.

C. Quality Standards

1. Materials, lettering and individual system color coding schemes shall be uniform and of one single manufacturer.

2. No identification shall be installed until systems are complete and insulated.
3. Surfaces shall be cleaned and dry prior to installation of identification.
4. No nametag or identification shall break or penetrate a surface used as a vapor barrier.

D. Manufacturers

1. Pipe and duct identification, valve tags, and equipment nameplates shall be manufactured by Seton Nameplate, W.H. Brady, or equal.

PART 2 – PRODUCTS

2.01 PIPE IDENTIFICATION

A. Piping, except that piping which is within inaccessible chases, shall be identified with semi-rigid plastic identification markers. Direction of flow arrows are to be included on each marker. Each marker background shall be appropriately color coded with a clearly printed legend to identify the contents of the pipe in conformance with the "Scheme for the Identification of Piping Systems" (ASME A13.1-1981). Snap-around markers shall be used for overall diameters up to 6" and strap-around markers shall be used above 6" overall diameters. Markers shall be located adjacent to each valve, at each branch, at each cap for future, at each riser takeoff, at each pipe passage through wall, at each pipe passage at 20' – 0" intervals maximum. Non-potable water lines and outlets shall be identified in accordance with the requirements of the California State Plumbing Code.

2.02 VALVE TAGS AND CHARTS

A. Provide valve tags on main and branch piping valves regardless of service.

B. Valves shall be designated by distinguishing numbers and letters carefully coordinated with a valve chart. Valve tags shall be 19 gauge polished brass, 1 ½" diameter with stamped back filled letters. Lettering shall be ¼" high for type service and ½" for valve number. Tag shall be attached to valves with approved brass "S" hooks, or brass jack chain. Whenever a valve is above a hung ceiling, the valve tag shall be located immediately above the hung ceiling. Valves that are equipped with chain operators shall have additional tag secured to the hook or chain that supports the swagged chain.

C. Furnish a minimum of (2) typed valve lists to be framed under glass or Plexiglas. Each chart shall be enclosed in an approved 0.015" thick plastic closure for permanent protection. Valve numbers shall correspond to those indicated on the Record Drawings and on the printed valve lists. The printed list shall include the valve number, location and purpose of each valve. It shall state other necessary information such as the required opening or closing of another valve when one valve is to be opened or closed. Printed frame valve lists shall be displayed in each Mechanical Room or in a location designated by the Owner's Representative.

2.03 DUCTWORK IDENTIFICATION

A. Ductwork (supply, return, exhaust) serving multiple spaces or floors shall be identified with directional flow arrows and unit identification numbers (i.e., FC-1, EX-1) on the side of each duct (or bottom if abutting other systems or obstructions). Ductwork stencils shall be 2 inch high lettering.

2.04 EQUIPMENT NAMEPLATES

A. Provide equipment nameplates with unit number and service designation.

B. Equipment nameplates shall be ¾" x 2 ½" long, 0.02" aluminum with a black enamel background with engraved natural aluminum letters. Nameplate shall have pressure sensitive taped backing.

C. The nameplate shall contain the unit or equipment designation ("AHU" for air handling unit, "FCU" for fan coil unit, "P" for circulating pump, etc.), unit number and area or system served.

D. Nameplates for exterior equipment shall be applied with waterproof adhesive.

E. The tags shall be color codes as follows:

1. Yellow – HVAC
2. Red – Life Safety (fire dampers, sprinkler valves, etc.)
3. Green- Plumbing Valves.
4. Blue – Heating/Cooling Valves.

PART 3 – EXECUTION

3.01 PREPARATION

A. Surfaces shall be cleaned and insulated (if applicable) prior to installing any identification.

B. Exterior surfaces of outdoor equipment shall be dry and prepared to accept the specified identification.

3.02 INSTALLATION

A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure Permanent adhesion and seal with clear lacquer.

B. Install tags with corrosion resistant chain.

C. Install duct markers in accordance with manufacturer's instructions.

D. Install plastic tape markers complete around pipe in accordance with manufacturer's instructions.

E. Identify major equipment such as outdoor condenser units with plastic nameplates.

F. Identify control panels and major control components outside panels with plastic nameplates.

G. Identify thermostats relating to air handling equipment serving multiple spaces.

H. Identify valves in main and branch piping with tags.

I. Identify heat pump unit valves with number tags.

J. Tag automatic controls, instruments and relays. Key to control schematic.

K. Identify piping, concealed or exposed, with plastic pipe markers or where buried using plastic tape pipe markers. Use tags on piping ¾ inch diameter and smaller. Identify service, flow direction and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops,

adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

L. Identify ductwork with plastic nameplates and flow arrows. Identify with air handling unit or fan identification number and area served. Locate identification at air handling unit or fan, at each side of penetration of structure or enclosure, and at each obstruction.

M. Install colored ceiling tacks in acoustical tile ceilings to identify location of equipment, valves and dampers that require maintenance or are part of a life safety system (fire dampers, smoke dampers, sprinkler valves or main isolation valves).

N. Install exterior service location plaques at entrance and underground plastic pipe markers 6 to 8 inches below finish grade, directly above buried pipes.

O. All markers and identification tags shall be installed prior to ceiling tiles or hard ceilings are installed.

END OF SECTION

SECTION 23 00 83
PIPE INSULATION

PART 1 – GENERAL

1.01. WORK INCLUDED

A. Furnish and install piping insulation, vapor barriers, jackets, finishes, adhesives, cements and accessories to make a complete and insulated system of piping, valves, fittings, joints, offsets and flanges specified herein.

B. Insulate the following:

1. HVAC hot water, valves, fittings, elbows, flanges and accessories.
2. Piping exposed to weather including provision of additional weatherproof jacket.
3. Cold water make-up piping and valves where exposed in mechanical rooms.
4. Drain, waste and overflow piping receiving cold water over offices. or occupied spaces.
5. All plumbing hot water, and recirculation water piping including all fittings, valves, elbows, flanges and accessories and cold water piping where exposed in mechanical rooms.
6. Handicap lavatory and sink supplies, waste and trap.

C. Refer to Part 3 for installation requirements.

1.02. RELATED SECTIONS

A. Examine drawings and Section of the Specifications for requirements which affect work under this Section, including the following:

1. 23 00 10 – Mechanical General Provisions
2. 23 00 50 – Basic Mechanical Materials and Methods

1.03. REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as follows:

1. ASTM A 666 – Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar; 1499a.
2. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Steel and Plate; 1995.
3. ASTM B 209M – Standard Specification for Aluminum and Aluminum-Alloy Sheet and plate (Metric); 1995.
4. ASTM C 177 – Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus; 1985 (Reapproved 1993).
5. ASTM C 195 – Standard Specification for Mineral Fiber Thermal Insulating Cement; 1990.
6. ASTM C 240 – Standard Test Methods of Testing Cellular Glass Insulation Block; 1991.
7. ASTM C 449/C 449M – Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement; 1988.
8. ASTM C 518 – Standard Test method for Steady-State Heat Flux Measurements and Thermal Insulating and Finishing Cement; 1988.

9. ASTM C 533 – Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation; 1985 (Reapproved 1990).
10. ASTM C 534 – Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 1994.
11. ASTM C 547 – Standard Specification for Mineral Fiber Pipe Insulation; 1995.
12. ASTM C 552 – Standard Specification for Cellular Glass Thermal Insulation; 1991.
13. ASTM C 578 – Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation; 1992.
14. ASTM C 591 – Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation; 1994.
15. ASTM C 610 – Standard Specification for Molded Expanded Perlite Block and Pipe Thermal Insulation; 1995.
16. ASTM C 795 – Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 1992.
17. ASTM C 921 – Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation; 1989.
18. ASTM D 1056 – Standard Specification for Flexible Cellular Materials – Sponge ore Expanded Rubber; 1991.
19. ASTM D 1667 – Standard Specification for Flexible Cellular Materials – vinyl Chloride Polymers and Copolymers (Closed-Cell Foam); 1976 (Reapproved 1990).
20. ASTM D 1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds; 1992.
21. ASTM D 2842 – Standard Test Method for Water Absorption of Rigid Cellular Plastics; 1994.
22. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 1995.
23. ASTM E 96 – Standard Test Methods for Water Vapor Transmission Materials; 1995.
24. NFPA 225 – Standard Method of Test of Surface Burning Characteristics of Building Materials; 1990.
25. UL 723 – Standard for Test for Surface Burning Characteristics of Building Materials; 1993.

1.04. SUBMITTALS

A. Refer to Div.1 – SUBMITTALS.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

C. Manufacturer’s Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.05. QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL.

B. Qualifications

1. Manufacturer: Company specializing in manufacturing of products specified in this section, with documented experience of more than ten (10) years.

2. Installer: Company specializing in performing scope of work specified in this section, with documented experience of more than ten (10) years.

C. Quality Standards

1. Insulation materials, finishes, coatings, cements, jackets and other insulation accessories shall have minimum composite or individual fire hazard ratings as well as thickness and "C" values conforming to California Energy Code which control building construction materials that may be used on this project. Where specification requirements exceed the Energy Code requirements, the specification shall govern.

2. Piping insulation for the various piping systems and associated equipment shall be composed of materials which are non-combustible and/or provide a fire resistive system of insulation which complies with the California Building Code.

3. Fire hazard ratings shall not exceed the following, except as noted:

   a. Flame Spread Rating: 25 (No Exceptions)
   b. Smoke Developed Rating: 50

4. Fire hazard ratings shall be as determined by NFPA 255 "Method of Test of Surface Burning Characteristics of Building Materials", ASTM E84 or UL 723.

5. Insulation materials herein specified shall be used subject to the manufacturer's temperature limitations and their compatibility with other materials.

6. The finished installation shall present a neat and workmanlike appearance with all jackets smooth, and all vapor barriers sealed and intact.

7. Where insulation is specified for piping, include connections, vents, drains and piping connected to system subject to heat loss or gain. Do not cover vent petcocks, cleanouts or other maintenance points on equipment unless identified on the insulation with removable access panels or covers.
8. Zeston 25/50 fitting insulation covers with blanket inserts may be used for heating systems only. Submit details to the Owner's Representative for approval.

1.06. PIPING CLASSIFICATION

A. For the purpose of these insulation specifications the following classification shall govern:

1. Cold Water: Up to 60°F.
2. Hot Water: 61°F and up.

1.07. PIPING INSULATION REQUIREMENTS

B. Schedule (ASJ = "All-Service-Jacket")

Service	Type Insulation and Thickness (Inches)	Concealed Areas	Finished Areas	Notes
Condensation Drains & Vents, Cold Water Make-up	Molded Fiber Glass 1	ASJ ASJ	ASJ	3
Refrigerant Piping Up to 1"	Preformed Closed Cell 1			
Domestic Water (Hot, Cold and Recirculation)	Molded Fiber Glass 1	ASJ	ASJ	3, 4

C. Insulation Schedule Notes

1. Provide calcium silicate insulation at hanger locations for all steam, condensate, hot water and chilled water piping 2-1/2 inch pipe size and above.
2. Where "Finishing Cement" finishes are scheduled, refer to specifications for Cement for materials, method of application and thickness.
3. Provide vapor barrier on cold water piping.
4. Domestic cold water piping shall be insulated in mechanical rooms only.

PART 2 – PRODUCTS

2.01. PIPING INSULATION – GENERAL

A. Insulation materials shall be of the highest grade and shall be the standard products as manufactured by companies who can comply with the fire hazard ratings set forth under General Requirements, and other specific requirements hereinafter specified.

B. Manufacturers shall include Owens-Corning Fiberglas (OCF), Certain-Teed Products Corp. (CSG), Manville (M), Knauf (K), or equal. Products of a single manufacturer are listed below to establish minimum standards.

C. Finishes, adhesives, cements, jackets and accessories shall be as approved for use by the particular manufacturer and shall include, Benjamin-Foster (BF), Ceel-Co (CC) Chicago-Mastic (CM), Insul-Coustic (IC), 3M, St. Clair Rubber (SCR), Vimasco (V), Baldwin-Ehret-Hill (BEH), H.K. Porter (HKP), or equal. Products of a single manufacturer are listed below to establish minimum standards.

2.02. MOLDED FIBER GLASS INSULATION

A. Molded fiber glass insulation shall be Owens-Corning Type SSL-II with ASJ (see jacket specs) 1-piece pipe insulation or equal. Insulation shall have a minimum density of 4.0 lbs./cu.ft. and a maximum thermal conductivity of 0.25 at 75°F.

B. Insulation of this type for copper piping shall be molded to separate dimensional standards than those used for IPS steel lines.

C. Fittings on pipe lines in finished and concealed areas shall be covered with premolded fiberglass pipe fitting insulators Insul-Coustic or equal, where sizes are available, otherwise, use mitercut segments of molded pipe insulation, wire in place with joints and raw edges sealed with adhesive and smoothed out with a coat of insulating cement.

D. On cold water pipes the fittings shall be finished with (2) coats of an approved vapor barrier mastic, reinforced with glass cloth extending 2 inches onto adjacent pipe insulation. Hot pipes shall be finished in a similar manner except the mastic need not be of the vapor barrier type.

2.03. HYDROUS CALCIUM SILICATE PIPE INSULATION

A. Molded, rigid, asbestos free, hydrous calcium silicate water resistant pipe insulation shall be Owens-Corning Fiberglas Kaylo 10, Manville Thermo-12 or equal, molded to dimensional standards conforming to the pipe. Insulation shall have an approximate density of 11 lbs./cu.ft., an approximate thermal conductivity of 0.41 at 200°F mean temperature and shall be suitable for application on surfaces which reach 1200°F. Insulation shall be supplied with factory applied jacket. A jacket, as hereinafter specified, shall be applied in the field. This material shall be used

in finished and concealed areas. Insulation shall have joints made with an approved insulation cement to prevent heat leakage through joints. Insulation shall be secured by wire on 9 inch centers.

B. At pipe hanger locations provide hard calcium silicate insulation material, to allow for the insulation to be installed through the hangers without the use of shields and without insulation safing. Hard insulation shall extend 12 inches to either side of hanger. Coordinate this requirement with the Hanger specification included herein under Section 15060 of these specifications.

2.04. PREFORMED ELASTOMERIC CLOSED CELL INSULATION

A. Preformed, flexible elastomeric cellular thermal insulation, manufactured without the use of CFC's, HFC's, or HCFC's formaldehyde free, low VOC's, fiber free, dust free, mold and mildew resistant with antimicrobial protection. Closed cell insulation shall be Armacell AP/ Armaflex SS or equal. Insulation shall have thermal conductivity of 0.27 at 75°F mean temperature.

B. At pipe hanger locations provide hard calcium silicate insulation material, to allow for the insulation to be installed through the hangers without the use of shields and without insulation safing. Hard insulation shall extend 12 inches to either side of hanger. Coordinate this requirement with the Hanger specification included herein under Section 15060 of these specifications.

C. Provide white PVC jacket for all indoor piping installation including pipe fittings. PVC jacket shall be Zeston 2000/3000 and installed per manufacturer's requirement.

2.05. JACKETS

A. Calcium silicate piping insulation in finished areas shall have a finish jacket of H.K. Porterlag or equal Lagging Cloth having a treated weight of 16 oz./sq.yd. Calcium silicate piping for generator exhaust piping shall be jacketed with corrugated aluminum.

B. Aluminum jackets shall consist of welded 20 gauge for exterior piping or 0.016 inch thick embossed aluminum with 2 inch laps on longitudinal and circumferential joints for interior piping. Joints shall be positioned to shed water. Joints shall be sealed with a clear silicone caulking compound. Secure in place with 3/4 inch wide by 0.015 inch aluminum bands 18 inches on center.

C. Molded fiber glass pipe and cellular foam glass insulation in both concealed and finished areas shall have a factory applied jacket, Owens-Corning Fiberglass ASJ or equal, consisting of vinyl coated and embossed vapor barrier laminate having a vapor permeance of 0.02 perms and a beach puncture of minimum of 50 units.

D. Piping exposed to weather shall be insulated as herein specified and shall be covered, as follows:

1. Pipe insulation and fittings shall be covered with Ceel-Tite 300 UVR Series or equal, 0.020 inch thick.
2. Ceel-Tite or equal pipe insulation jacketings shall be provided with a minimum of 1inch overlap.
3. Seams (longitudinal) shall be welded together with Ceel-Tite welding #300 adhesive or equal.
4. Adjacent jacketing shall overlap 3/4 inch and all circumferential seams shall be welded together with Ceel-Tite welding #300 adhesive, or equal.

5. Fitting covers shall overlap to adjacent pipe insulation jacketing. Longitudinal and circumferential seams shall be welded together with Ceel-Tite #300 adhesive or equal.
6. A bead of Ceel-Tite #300 adhesive or approved equal, 1/8 inch in diameter shall be applied under overlapping joints and to outside of overlap and shall be feathered.
7. Joints shall be pressed down using elastic cord or duct tape to insure even spread of welding adhesive.
8. Cap off ends with Ceel-Tite 300 Series or equal caps. Caps shall also be used for unions, reducers, flanges, valve covers and other accessories.
9. Garlock washer shall be installed underneath the cap.
10. A high temperature silicone caulking shall be applied between the cap and the pipe.
11. Due to thermal expansion of jacketing, a simple slip joint should be used on long continuous runs of pipe (every 24' – 0" to 30' –0") and between fittings if the distance exceeds 8' –0". A slip joint should also be used between fixed supports. A slip joint can be made by extending the overlapping section 6 to 10 inches beyond normal.

E. HVAC piping exposed within the utility tunnel(s) and corridors which are not above ceilings, shall be covered with a smooth aluminum jacket.

2.06. ADHESIVES, COATINGS AND SEALANTS

A. Adhesives, coatings and sealants shall be compatible with other insulation materials as recommended by the manufacturer. The following is a partial list of services and the corresponding material to be used. Other equal products as recommended by manufacturer may be used, subject to approval of the Owner's Representative:

1. For sealing vapor barriers: F 85-20 or equal
2. Fittings, valves, flanges for cold water and drain piping: F 30-35 or equal
3. For sealing joints in fiberglass ASJ: ASJ joint sealing tape

2.07. CEMENTS

A. Finishing and insulating cement shall be Manville #375 or equal, and Portland Cement. Mix (1) part Portland cement and (2) parts product, by weight. Finish shall be ½ inch thick, applied in (2) layers, reinforced by 1 ¼ inch mesh, with corners provided with corner beads. Surface shall be trowelled to a smooth hard finish.

B. Insulating cement shall be Manville #460 or equal.

C. Insulating cement for use with calcium silicate insulation shall be Manville Superex, or equal.

2.08. ACCESSORIES AND FASTENING MATERIALS

A. Staples shall be on of the outward clinching type of corrosion resisting steel. Use of staples shall be limited to materials and locations, as approved by the Owner's Representative. In addition, all longitudinal and circumferential insulation laps shall be overlapped and glued with glue as recommended by the insulation manufacturer.

B. Wire for securing insulation and jackets shall be #16 AWG copper, copper clad steel or nickel copper alloy.

C. Wire netting for exposed surfaces of insulation to be cement finished shall be #16 AWG, ¼ inch or 1 inch mesh galvanized.

D. Premolded fiber glass pipe fittings shall be Insul-Coustic, Insular or equal.

E. Welded steel wire fabric shall be 6 gauge, 6/6 mesh in accordance with ASTM A185.

2.09. HANDICAPPED LAVATORIES

A. Truebro Handi Lav-Guard or Brocar Products Trapwrap #C-500R or equal, insulation kit, 3-piece interlocking for “P” trap assembly and 2-piece kit shall be white flexible vinyl insulation secured with nylon fasteners supplied.

PART 3 –EXECUTION

3.01. INSTALLATION OF PIPING INSULATION

A. Insulation shall be applied in accordance with highest industry standard of care.

B. Test, inspect and clean surfaces to be insulated before applying insulation.

C. Take precautions to protect work of other Sections. Provide protective covering as required to accomplish this end. Return equipment and material to its original new condition and appearance where damage occurs.

D. Protect insulation on piping 2 ½” and up where supported in hangers by means of calcium silicate rigid pipe insulation or jackets. Saddles or shaped galvanized steel pieces approximately 10” long by half the circumferences of insulated pipe.

E. Piping shall have been tested and approved prior to installation of insulation.

F. Piping or surfaces where subject to condensation on the outside shall be insulated including vaporseal finish.

G. Surfaces to be insulated shall be clean, dry and free from rust and scale when insulation is being applied. Insulation shall be dry at the time of installation and before and during the process of finished application.

H. Butt ends will not be allowed. However, where required and approved by Owner’s Representative, jacket material shall be pasted over exposed ends and banded to give a neat and finished appearance. Exposed insulation material will not be permitted.

I. Surfaces or insulation shall be smooth, even and true to line with jackets drawn tight and smoothly secured. Scrap pieces of insulation shall not be used where a full length section will fit.

J. The methods of application of insulation, finishes, adhesives, cements, accessories are generally specified under the material headings of these specifications. Where not specifically detailed, it is intended that they are equal or exceed the manufacturer’s published recommendations, existing at time of bid opening, subject to the approval of the Owner’s Representative.

K. Butt covering neatly to walls, floors, ceiling. Apply band at end and position so band covers gap between surface and insulation where exposed.

L. Fastenings: Provide where required to securely hold insulation, fasten covering with aluminum bands at midpoint and at end of sections. Apply adhesive on exposed risers to prevent slipping and turning.

M. Thickness of insulation shall not be compromised due to piping interferences, improper installation or any other reason.

N. Pipe labels, including flow arrows, shall be applied to the outside of the finished insulation system/jacket. Indicate location of pipe unions and flanges on the outside of the finished insulation system/jacket.

END OF SECTION

SECTION 23 04 10
PLUMBING VALVES

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Furnish and install isolation check, balancing and other type valves and strainers as shown on the drawings.

B. Provide isolation valves at drains, piping mains and branches of all piping systems, equipment, risers and before and after control devices.

C. Refer to Part 3 for installation requirements.

1.02 *RELATED SECTIONS*

A. Examine drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.03 REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as follows:

1.	ANSI	American National Standards Institute
2.	ASME	American Society of Mechanical Engineers
3.	ASTM	American Society of Testing Materials
4.	AWS	American Welding Society
5.	CS	Commercial Standards, U.S. Dept. of Commerce
6.	FM	Factory Mutual
7.	FS	Federal Specification, U.S. Government
8.	MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
9.	UL	Underwriters Laboratories, Inc.
10.	OSHA	Occupational Safety and Health Act
11.	NFPA	National Fire Protection Assn.

1.04 SYSTEM DESCRIPTION

A. Provide shut-off, gate, butterfly, check, strainers, balancing and other types of valves as shown on the drawings and required for proper maintenance, isolation and safety of piping systems.

B. Provide isolation valves at systems drains and piping mains and branches for fixtures and piping systems, etc., at all fixtures and equipment and before and after backflow preventers, meters and pressure reducing valves.

1.05 SUBMITTALS

A. Refer to Div.1 – SUBMMITALS

B. Prepare and submit shop drawings and samples in accordance with the requirements of the General Conditions and Supplementary Conditions and in the manner described therein, modified as noted hereinafter.

C. Valves and strainers of the same type shall be of the same manufacturer. Before purchasing any valve, the Contractor shall submit for approval the name of the manufacturer, the figure number which he proposes to furnish, and engineering data on each figure number. For manufacturers, see schedules herein.

1.06 QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL

B. Qualifications

1. Manufacturer: Company specializing in manufacturing valve and strainer products specified in this section, with documented 10 years experience. All valves shall be of United States manufacture.

C. Quality Standards

1. Valves and strainers shall be marked at the factory and shall contain manufacturer name, catalog or figure number, size and pressure class marked on the valve body, arrows to indicate direction of flow on check, globe and angle valves and UL label.

1.07 REGULATORY REQUIREMENTS

A. Perform Work in accordance with California Plumbing Code.

B. Conform to California Plumbing Code for installation of water heater safety valves and backflow prevention devices.

C. Provide certificate of compliance from the Owner's Representative indicating approval of installation of water heaters, piping, vents and backflow prevention devices.

PART 2 – PRODUCTS

2.01 VALVES, FLANGES AND UNIONS

A. General

1. Systems under this Section shall be provided with valves to permit complete and/or sectional control of the systems. They shall be located to permit easy operation, replacement and repair. They shall be installed where shown on the drawings, or as herein specified. They shall be of domestic manufacture and the product of the specified manufacturer or as manufactured by one of the following companies: Nibco, Milwaukee, Apollo, Jenkins Brothers, Watts, Armstrong, or equal.
2. Pack stems in accordance with ANSI B16.34.
3. Each valve shall be the same size as the pipe in which it is installed.

2.02 WATER VALVES

A. Water valves 2” and smaller shall be bronze ball valves Nibco S-585-70-66, or equal, full port teflon seated stainless steel ball and stem, 2-piece valve body designed for 600 psi water.

B. Water valves larger than 2” and smaller than 4” shall be 2 piece body, bronze ball valves Nibco T-580-70-66 or equal conventional port stainless steel ball and stem, sweated ends and teflon seats designed for 600 lbs. non-shock cold water.

C. Water valves 4” and larger shall be class 250 butter fly valves, flanged ends, ductile iron body, with polymide seat, EPDM coated brass disc and latch lock operator, Nibco FD3765-3 or equal.

D. Provide lined sized ball type drain valves with hose end drain, cap and chain, Nibco 585-70-HC or equal. Provide at low points in water piping system and at the base of risers so that entire system may be drained.

E. Balance valves shall be equal to Nibco 1710 or equal with memory stops and test ports.

PART 3 – EXECUTION

3.01 CONNECTIONS

A. Furnish and install valves to isolate fixtures and equipment. Obtain exact rough in dimensions from manufacturers of service locations before connecting or roughing for fixtures and/or equipment.

3.02 INSPECTION

A. Examine equipment and ensure that it is clean and dry, constructed within specified tolerances and dimensions, and is free of deleterious materials such that potential defects and poor workmanship shall not occur.

B. Do not proceed with the work until conditions are satisfactory.

3.03 INSTALLATION

A. Install valves in accordance with manufacturer’s printed instructions and as indicated on the drawings.

B. Where valves are required on insulated lines, extend the valve stem to prevent damage from occurring to the piping insulation.

3.04 ADJUSTMENT AND CLEANING

A. Valves and stops shall be adjusted, packed and repacked as may be required to eliminate leaks and to meet flow requirements of ASME B31.

END OF SECTION

SECTION 23 04 11
WATER DISTRIBUTION PIPING

PART 1 – GENERAL

1.01 WORK INCLUDED

A. The work shall include labor, materials, tools, equipment, transportation, insurance, temporary protection, supervision and incidental items essential for proper installation and operation, even though not specifically mentioned or indicated on the drawings but which are usually provided or are essential for proper installation of systems related to this Section, as indicated on the drawings and specified herein.

B. The specifications and drawings describe the minimum requirements that must be met for the installation of work as shown on the drawings and as specified herein under.

C. Shop drawings.

D. Field acceptance testing.

E. Specific work: Provide potable water piping, etc., as shown on the drawings and as specified, complete.

1.02 RELATED SECTIONS

A. Examine drawings and criteria sheets and other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.03 REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

1. Material standards shall be as specified or detailed hereinafter and as follows:
   a. ANSI American National Standards Institute
   b. ASME American Society of Mechanical Engineers
   c. ASTM American Society of Testing Materials ASTM B88-78: Wrought Copper Fittings
   d. AWS American Welding Society
   e. CS Commercial Standards, U.S. Dept. of Commerce
   f. FM Factory Mutual
   g. FS Federal Specification, U.S. Government
   h. MSS Manufacturers Standardization Society of the Valve and Fittings
   i. UL Underwriters Laboratories, Inc.
   j. OSHA Occupational Safety and Health Act
   k. ASPE American Society of Plumbing Engineers

1.04 SUBMITTALS

A. Refer to Div.1 – SUBMITTALS.

B. Prepare and submit shop drawings in accordance with the requirements of the General Conditions and Supplementary Conditions and in the manner described therein, modified as noted hereinafter.

C. Submittals – The following documents shall be provided:

1. Pipe and fittings for each system.

1.05 QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Copper Tube and Fittings
1. Provide seamless copper water tube conforming to the requirements of ASTM specification B88 in weight L, and temper annealed or drawn as specified.
2. Fittings for Copper Water Tube
   a. Provide wrought pressure solder joint fittings, pressure fittings conforming to ANSI B16.22
   b. Provide cast bronze solder joints pressure fittings conforming to ANSI B16.18 and same weight as pipe.
   c. Brazolets shall be high silicon bronze conforming to ASTM B283 in sizes 2 inches and smaller an conforming to MIL B-16451 in sizes 2-1/2 inches and larger.
   d. Solder or braze joint fittings shall have integral factory formed pipe stops on each inlet or outlet.
   e. Joints shall be made with approved factory formed fittings. Mechanical formed tee outlets utilizing mechanically extracted collars shall not be used.

2.02 UNIONS

A. Provide union connections to fixtures and equipment. Union connections include compression fittings, grooved couplings and flared fittings.

1. Unions on copper piping shall be bronze minimum working pressure of 200 psi.

2.03 COPPER TUBING AND FITTINGS – ABOVE GROUND

A. Type L Above Ground, Potable and Industrial Water Systems

1. Tubing to be Type L hard temper with wrought copper fittings conforming to ASTM B88. Joints shall be soldered with ASME BWS/A5.8 lead free solder.
2. Exposed piping in finished rooms used in connection with plumbing fixtures shall be chrome plated.

2.04 SOLDER

A. Domestic and industrial water piping shall be soldered using 95-5 Lead Free, ASTM B32.

2.05 COPPER TUBING AND FITTINGS BELOW GROUND

A. Type K Below Ground, Potable and Industrial Water Systems

1. Tubing to be Type K hard temper with wrought copper fittings conforming to ASTM B88. Joints shall be brazed.

PART 3 – EXECUTION

3.01 CONNECTIONS TO EQUIPMENT

A. Furnish and install potable and industrial cold water and hot water, for final connections to sinks, showers, laboratory equipment, casework and emergency stations provided under other Sections. Roughing for this equipment shall be as indicated on the drawings.

B. Obtain exact roughing in dimensions from manufacturers of service locations before connecting to or roughing for equipment. Provide accessible shutoff valves at each piece of equipment.

C. Contractor furnished equipment shall be set under other Sections. Provide roughing and final connections including piping. Conduct final/correct coordination of equipment based on actual and approved shop drawings. Equipment included shall be:

1. Preformed sink tops
2. Owner furnished equipment

3.02 WATER PIPING INSTALLATION

A. Test water piping in accordance with this Specification.

B. Pipe used in piping assembly must be clean of dirt and obstructions and shall have ends square and reamed before butting into the fittings.

C. Cut the tube to the required length with tube cutter designed for copper work.

D. Remove burrs from the inside and outside of the cut edge and clean the end of the tube with steel wool or sand cloth until discoloration is removed and metal is smooth and bright.

E. Oxides will be removed by sand cloth, brush, etc.

F. Removal of oxides or discoloration of pipe and fittings by acids or self-cleaning flux is forbidden.

G. Apply a thin, uniform and complete coating of reliable brand of soldering flux meeting the ASME BWS/A5.8, lead free to the cleaned surfaces of the tube and fittings.

H. When joints are soldered, remove excess solder with a cloth or brush leaving a fillet of solder in the chamber at the end of the fitting.

I. Piping must be true and plumb and with proper pitch (1” in 50’) for draining after soldering. Provide ball type ¾” hose valves at low points.

J. Lines of water piping shall be protected from water hammer by shock absorbers. Where shock absorbers (or shocks) are used, they shall be as manufactured by Precision Plumbing Products (PPP), Sioux Chief or equal and shall conform to the Plumbing and Drainage Institute published requirements and shall be made accessible through access panels.

K. Furnish and install valves required to isolate sections of the piping system extending into areas scheduled for construction at a later date. Provide draw-off valves which may be required to properly chlorinate the system in sections as required by the phasing of the Building. Identify isolation future and phasing valves as such with valve tags and include same on charts and as-built drawings.

L. Connections to tanks and equipment shall be made with unions.

M. Allowances for expansion shall be made in the installation of piping so that the usual variation in temperature will not cause stress at any point. Pipes shall be securely anchored where necessary to distribute expansion stresses.

3.03 STERILIZATION

A. General:

1. Supervision and Testing: Perform entire disinfection procedure under the supervision of Environmental, Healthy and Safety (EH&S). Provide 5 days notice of schedule procedure.

2. Contractor's Responsibility: Furnish labor, equipment, materials and transportation to disinfect domestic hot and cold water systems and fire lines directly connected thereto, in conformity with procedures and standards described herein.

3. Disinfecting Agent: An Aqueous solution of sodium hypochloride (minimum 5.25% available chlorine). The use of powdered hypochlorite and chlorine gas are prohibited unless specifically approved by Environmental, Health and Safety (EH&S).

B. Preliminary Preparations:

1. Service Cock: Provide within 3 feet of the entrance of the supply main to the building a ¾ inch service cock, or valve, for the purpose of introducing the disinfecting agent into the lines.

2. Flushing: After final pressure test and before draining for disinfection, open each fixture or outlet until the water flow is clear.

C. Disinfection Procedure:

1. Drain entire domestic water system including fire line.

2. Post suitable warning signs at each outlet: 'Warning – Do Not Use – Water System Being Chlorinated'.

3. Inject disinfectant solution into the system through the service cock by means of a pump, or other pressure device, at a slow continuous rate, simultaneous with a reduced flow from the water main, until the orthotolidin test for residual chlorine at each outlet shows a concentration of at least 50ppm, but not more than 100 ppm.

4. Close all outlets and valves, including the service valve at the main and the injection cock. Retain the chlorinated water in the system for 24 hours.

5. After 24 hour holding period, the residual chlorine concentration shall be not less the 50 ppm as shown by the orthotolidin test.

6. Drain and flush entire domestic water system until ortholidin test show background residual chlorine concentration at any outlet.

7. Environmental, Health and Safety (EH&S) will determine whether samples of water must be collected and analyzed for the determination of bacteriological quality.

D. Standards Necessary for Approval:

1. The water system shall be uniformly chlorinated under the supervision of Environmental, Health and Safety (EH&S) as outlined in the 'Disinfection Procedure'.

2. The result of water sample analysis shall be negative for the Coliform organism.

3. If the test for the bacteriological quality of the water in the system does not meet the standards, repeat the disinfection procedure until the specified standards are met.

E. Final Approval: Environmental, health and Safety (EH&S) will give written approval to the Owner for acceptance and use of the water system after the above procedures have been successfully completed and the standards met.

3.04 PIPE TESTING

A. Piping System Leak Test

1. Domestic and Industrial Water Piping
   a. General: After completion of the work, but before final acceptance is made, run a test over a four-hour period of time to prove that the capacity and performance of apparatus fittings and the system as a whole meets the requirements of the specifications.
   b. Pressure Tests: Make pressure tests in the presence of Owner's Representative.
      1) Cold and hot water services within the building shall be tested at 120 psi for a period of 4 hours. Joints showing visible leakage shall be cut out and remade; penning of joints shall not be permitted. Sections of pipe work containing remade joints shall be retested. Tests shall be carried out using Bristol recording device. Data disc shall be given to Owner's Representative after successful completion of test.

END OF SECTION

SECTION 23 04 19
NATURAL GAS PIPING

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

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

1.02. SUMMARY

A. This section includes piping, specialties, and accessories for natural gas piping system within building, above and below ground; and to the interface points indicated.

B. Related Sections: The following sections contain requirements that relate to this sections:
1. 23 00 50, Basic Mechanical Materials and Methods.
2. 23 00 60, Hangers, Supports, and Anchors.
3. 23 00 75, Mechanical Identification.
4. 23 07 81, Rooftop Air Conditioning Units.

1.03. SYSTEM PERFORMANCE REQUIREMENTS

A. Minimum Working-Pressure Ratings: Except where otherwise indicated, minimum pressure requirements are as follows:
1. Low-Pressure Natural Gas Piping: 2 psig.

B. Approximate values of natural gas supplied for these systems are as follows:
1. Heating Value: 1000 Btu/cu. ft.
2. Specific Gravity: 0.6.
3. Service Line Pressure: 15 to 20 psig.

1.04. SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 specification sections.

B. Product Data for each type of natural gas specialty and special-duty valve. Include pressure rating, rated capacity, and settings of selected models.

C. Coordination Drawings for natural gas piping, including required clearances and relationship to other services for same work areas. See schedules on drawings.

D. Maintenance data for natural gas specialties and special-duty valves to include in the operation and maintenance manual specified in Section 01830, Operation and Maintenance.

1.05. QUALITY ASSURANCE

A. Comply with NFPA 54, “National Fuel Gas Code,” for gas piping materials and components; installations; and inspecting, testing, and purging.

B. Comply with NFPA 70, “National Electrical Code,” for electrical connections between wiring and electrically operated control devices.

C. California Plumbing Code 2016.

D. Provide listing/approval stamp, label, or other marking on equipment made to specified standards.

E. Listing and Labeling: Provide equipment and accessories specified in this section that are listed and labeled.
1. Terms “Listed” and “Labeled”: As defined in National Electrical Code, Article 100.

F. Product Options: Drawings indicate size, profiles, connections, dimensional requirements, and characteristics of natural gas piping equipment, specialties, and accessories and are based on specific types and models indicated. Other manufacturers’ equipment and components with equal performance characteristics may be considered. Refer to Section 01630, Product Options and Substitutions.

1.06. SEQUENCING AND SCHEDULING

A. Notification of Interruption of Service: Notify each affected user when gas supply will be turned off.

B. Work Interruptions: Leave gas piping systems in safe condition when interruptions in work occur during repairs or alterations to existing gas piping systems.

PART 2 – PRODUCT

2.01. MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:
1. Gas Stops, 2-Inch NPS and Smaller:
   a. Hammond Valve Corp.
   b. Jomar International, Ltd.
   c. Maxitrol Co.
   d. McDonald: A.Y. McDonald Mfg. Co.
   e. Milwaukee Valve Co., Inc.
   f. Mueller Co.
   g. National Meter.
2. Gas Valves, 2-Inch NPS and Smaller:
   a. Conbraco Industries, Inc.; Apollo Div.
   b. Core Industries, Inc.; Mueller Steam Specialty Div.
   c. Huber: J.M. Huber Corp.; Flow Control Div.
   d. McDonald: A.Y. McDonald Mfg. Co.
   e. Milliken Valve Co., Inc.
   f. Milwaukee Valve Co., Inc.
   g. Mueller Co.
   h. National Meter.
   i. Nordstrom Valves, Inc.
   j. Olson Technologies, Inc.
3. Gas Valves, 2-1/2-Inch NPS and Larger:
   a. Core Industries, Inc.; Mueller Steam Specialty Div.
   b. Huber: J.M. Huber Corp.; Flow Control Div.
   c. Milliken Valve Co., Inc.
   d. Nordstrom Valves, Inc.
   e. Olson Technologies, Inc.
   f. Xomox Corp.

2.02. PIPES

A. Steel Pipe Below Ground: ASTM A53, Schedule 40 black steel with ASME B16.11, forged steel, or ASTM A234/A234M forged steel welding type fittings. Joints shall be welded.

B. Steel Pipe Above Ground: ASTM A53; Schedule 40 black steel with ASME B16.3, malleable iron, ASME B16.11, forged steel, or ASTM A234/A234M, forged steel welding type. Joints shall be welded for pipe 2-1/2 inch and larger; threaded for 2 inch and smaller for low pressure system only.

2.03. PIPE FITTINGS

A. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern, with threaded ends conforming to ASME B1.20.1.

B. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends conforming to ASME B1.20.1.

C. Cast-Iron Flanges and Flanged Fittings: ASME B16.1, Classes 125 and 250.

D. Steel Fittings: ASME B16.9, wrought steel, butt-welding type; and ASME B16.11, forged steel.

E. Steel Flanges and Flanged Fittings: ASME B16.5.

F. Transition Fittings: Type, material, and end connections to match piping being joined.

2.04. JOINING MATERIALS

A. Common Joining Materials: Refer to Section 23 00 50, Basic Mechanical Materials and Methods, for joining materials not included in this section.

B. Joint Compound and Tape: Suitable for natural gas.

C. Gasket Material: Thickness, material, and type suitable for natural gas.

2.05. VALVES

A. Manual Valves: Conform to standards listed or, where appropriate, to ANSI Z21.15.

B. Gas Stops, 2-Inch NPS and Smaller: AGA-certified, bronze-body, plug type with bronze plug, ball type with chrome-plated brass ball, or butterfly valve with stainless-steel disc and fluorocarbon elastomer seal, for 2 psig or less natural gas. Include AGA stamp, flat or square head or lever handle, and threaded ends conforming to ASME B1.20.1. Locking Device: Include locking (tamperproof) feature.

C. Gas Valves, 2-Inch NPS and Smaller: ASME B16.33, 150 psig WOG, bronze body, bronze plug, straightaway pattern, square head, tapered-plug type, with threaded ends conforming to ASME B1.20.1. Locking Device: Include locking (tamperproof) feature.

D. Gas Valves, 2-1/2-Inch NPS and Larger: MSS SP-78, Class 125 or Class 175 WOG, lubricated-plug type, semi-steel body, wrench operated, with flanged ends. Locking Device: Include locking (tamperproof) feature.

2.06. SPECIALTY VALVES

A. Automatic Shutoff Valves: ANSI Z21.21, for operation by appliance automatic shutoff device. 2-inch NPS and smaller with threaded ends conforming to ASME B1.20.1 and 2-1/2-inch NPS and larger with flanged ends.

B. Earthquake-Actuated, Automatic, Gas Shutoff Valves: ANSI Z21.70, mechanical operation, with threaded ends conforming to ASME B1.20.1 for 2-inch NPS and smaller and flanged ends for 2-1/2-inch NPS and larger.

C. Flexible Connectors: ANSI Z21.24, copper alloy.

D. Strainers: Y pattern, full size of connecting piping. Include stainless-steel screens with 3/64-inch perforations, except where other screens are indicated.
1. Pressure Rating: 125-psig minimum steam or 175-psig WOG working pressure, except where otherwise indicated.
2. 2-Inch NPS and Smaller: Bronze body, with threaded ends conforming to ASME B1.20.1.
3. 2-1/2-Inch NPS and Larger: Cast-iron body, with flanged ends.
4. Screwed screen retainer with centered blow-down and pipe plug.

PART 3 – EXCUTION

3.01. PREPARATION

A. Close equipment shutoff valves before turning off gas to premises or section of piping. Perform leakage test as specified in Article 3.12, Field Quality Control, to determine that all equipment is turned off in affected piping section.

B. Comply with NFPA 54 Paragraph “Prevention of Accidental Ignition.”

3.02. PIPING APPLICATIONS

A. General: Flanges, unions, transition and special fittings, and valves with pressure ratings same as or higher than system pressure rating may be used in applications below, except where otherwise indicated.

B. Low-Pressure, 0.5 psig or Less, Natural Gas Systems: Use the following:
1. 1-Inch NPS and Smaller: Steel pipe, malleable-iron threaded fittings, and threaded joints.
2. 1-1/4- to 2-Inch NPS: Steel pipe, malleable-iron threaded fittings, and threaded joints.
3. 2-1/2- to 4-Inch NPS: Steel pipe, malleable-iron threaded fittings, and threaded joints.

3.03. VALVE APPLICATIONS

A. Use gas stops for shutoff to appliances with 2-inch NPS or smaller low-pressure gas supply.

B. Use gas valves for shutoff to appliances with 2-1/2-inch NPS or larger low-pressure gas supply and all sizes for medium-pressure gas supply.

C. Use gas valves of sizes indicated for gas service piping, meters, mains, and where indicated.

3.04. PIPING INSTALLATIONS

A. Refer to Section 23 00 50, Basic Mechanical Materials and Methods, for basic piping installation requirements.

B. Install gas piping at uniform grade of 0.1 percent slope upward toward risers.

C. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.

D. Connect branch piping from top or side of horizontal piping.

E. Install unions in pipes 2-inch NPS and smaller, adjacent to each valve, at final connection to each piece of equipment, and elsewhere as indicated. Unions are not required on flanged devices.

F. Install strainers on supply side of each control valve, gas pressure regulator, solenoid valve, and elsewhere as indicated.

G. Install dielectric fittings (unions and flanges) with ferrous and brass or bronze end connections, separated by insulating material, where piping of dissimilar metals is joined.

H. Install dielectric fittings (unions and flanges) with 2 ferrous end connections, separated by insulating material, at outlet from gas meter and, where indicated, for ferrous piping.

I. Install flanges on valves, specialties, and equipment having 2-1/2-inch NPS and larger connections.

J. Anchor piping to ensure proper direction of piping expansion and contraction. Install expansion joints, expansion loops, and pipe guides as indicated.

K. Install vent piping for gas pressure regulators and gas trains, extend outside building, and vent to atmosphere. Terminate vents with turned-down, reducing-elbow fittings with corrosion-resistant insect screens in large end.

3.05. JOINT CONSTRUCTION

A. Refer to Section 23 00 50, Basic Mechanical Materials and Methods, for basic piping joint construction.

B. Use materials suitable for natural gas service.

C. Brazed Joints: Make joints with brazing alloy having melting point greater than 1000 deg F. Brazing alloys containing phosphorus are prohibited.

3.06. VALVE INSTALLATION

A. Install valves in accessible locations, protected from damage. Tag valves with metal tag indicating piping supplied. Attach tag to valve with metal chain.

B. Refer to Section 23 00 50, Basic Mechanical Materials and Methods, for valve tags.

C. Install gas valve upstream from each gas pressure regulator. Where 2 gas pressure regulators are installed in series, valve is not required at second regulator.

D. Install pressure relief or pressure-limiting devices so they can be readily operated to determine if valve is free; test to determine pressure at which they will operate; and examine for leakage when in closed position.

3.07. HANGER AND SUPPORT INSTALLATION

A. Refer to Section 23 00 60, Hangers and Supports, for pipe hanger and support devices.

B. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
1. 1/2-Inch NPS: Maximum span, 72 inches; minimum rod size, 3/8 inch.
2. 3/4- and 1-Inch NPS: Maximum span, 96 inches; minimum rod size, 3/8 inch.
3. 1-1/4-Inch NPS: Maximum span, 108 inches; minimum rod size, 3/8 inch.
4. 1-1/2- and 2-Inch NPS: Maximum span, 108 inches; minimum rod size, 3/8 inch.
5. 2-1/2- to 3-1/2-Inch NPS: Maximum span, 10 feet; minimum rod size, 1/2 inch.
6. 4-Inch NPS and Larger: Maximum span, 10 feet; minimum rod size, 5/8 inch.
7. Support vertical pipe and tube at each floor.

3.08. CONNECTIONS

A. Install gas piping next to equipment and appliances using gas to allow service and maintenance.

B. Connect gas piping to equipment and appliances using gas with shutoff valves and unions. Install gas valve upstream from and within 72 inches of each appliance using gas. Install union or flanged connection downstream from valve. Include flexible connectors when indicated.

C. Sediment Traps: Install tee fitting with capped nipple in bottom forming drip, as close as practical to inlet for appliance using gas.

D. Electrical Connections: Wiring is specified in Division 16 Sections.

3.09. ELECTRICAL BONDING AND GROUNDING

A. Install aboveground portions of natural gas piping systems that are upstream from equipment shutoff valves, electrically continuous, and bonded to grounding electrode according to NFPA 70.

B. Do not use gas piping as grounding electrode.

3.010. FIELD QUALITY CONTROL

A. Inspect, test, and purge piping according to NFPA 54, Part 4 “Gas Piping Inspection, Testing, and Purging” and requirements of authorities having jurisdiction.

B. Pressure Test: Pressure test pipe no less than 125 PSI minimum for 4 hours duration without pressure loss.

C. Repair leaks and defects with new materials and retest system until satisfactory results are obtained.

D. Report test results promptly and in writing to Architect and authorities having jurisdiction.

E. Verify capacities and pressure ratings of gas meters, regulators, valves, and specialties.

F. Verify correct pressure settings for pressure regulators.

G. Verify that specified piping tests are complete.

3.011. ADJUSTING

A. Adjust controls and safety devices. Replace damaged and malfunctioning controls and safety devices.

END OF SECTION

SECTION 23 04 20
DRAINAGE AND VENT PIPING

PART 1 – GENERAL

1.01. WORK INCLUDED

A. The work shall include labor, materials, tools, equipment, transportation, insurance, temporary protection, supervision and incidental items essential for proper installation and operation, even though not specifically mentioned or indicated on the drawings but which are usually provided or are essential for proper installation of systems related to this Section, as indicated on the drawings and specified herein.

B. The specifications and drawings describe the minimum requirements that must be met for the installation of work as shown on the drawings and as specified hereinunder.

C. Shop drawings.

D. Field acceptance testing.

E. Specific Work

1. Provide storm, sanitary and specialty drain piping, fittings, piping network, branches and connections to piping, as shown on the drawings and as specified complete.

1.02. RELATED SECTIONS

A. Examine drawings and criteria sheets and other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.03. REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as follows:

1.	ANSI	American National Standards Institute ANSI B16.1, B16.2, B16.5, B16.4, B.16.9: Cast Iron Fittings & Flanges ANSI B16.3: Malleable Iron Fittings
2.	ARI	American Refrigeration Institute
3.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
4.	ASME	American Society of Mechanical Engineers
5.	ASTM	American Society of Testing Materials ASTM A-888: Cast Iron Piping
6.	AWS	American Welding Society
7.	CS	Commercial Standards, U.S. Dept. of Commerce
8.	FM	Factory Mutual
9.	FS	Federal Specification, U.S. Government
10.	MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
11.	UL	Underwriters Laboratories, Inc.

12. OSHA Occupational Safety and Health Act
13. CISPI Cast Iron Soil Pipe Institute CISPI 301 Cast Iron Pipe and Fittings
14. ASPE American Society of Plumbing Engineers

1.04. SUBMITTALS

A. Refer to Div.1 – SUBMITTALS.

B. Prepare and submit shop drawings in accordance with the requirements of the General Conditions and Supplementary Conditions and in the manner described therein, modified as noted hereinafter.

C. Submittals: The following documents shall be provided:
1. Pipe and fittings for each system.

1.05. QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL.

PART 2 – PRODUCTS

2.01. PIPING, FITTINGS AND JOINTS

A. Provide piping, fittings and flanges, unions, welding and soldering for main piping network, branches and connections for services as shown on the drawings. Piping, fittings and accessories shall conform to the class pipe as specified hereinafter.

B. Sanitary Drainage and Fittings

1. Aboveground Soil, Waste and Vent Piping (2” and larger)
   a. Hubless Cast Iron Soil Pipe: No-hub Schedule 40 pipe with Husky SD-4000 soil pipe coupling manufactured by Anaheim Foundry, 4-band clamp or Clamp-All Hi Torq 125 2-band clamp, or equal. Sealing gasket shall be neoprene in accordance with ASTM C564, CISPI 301-75.
2. Above Ground Soil, Waste and Vent Piping and Fittings (1 1/2” and smaller)
   a. Schedule 40 pipe with black cast iron drainage fittings.
3. Underground Soil Waste and Vent Pipe and Fittings (4” and larger)
   a. Asphaltum coated, service weight cast iron hub and spigot pipe and fittings with resilient neoprene push on joints. ASTM A72, ASTM C564-70.
4. Underground Soil Waste and Vent Pipe and Fittings (3” and smaller)
   a. Tubing to be Type K, soft temper brazed joints with bituminous coating.
5. Drain, Waste and Overflow Piping shall be insulate when receiving cold water condensate to 10’ from receiver.

C. Storm Drain Pipe and Fittings

1. Below Ground Piping
   a. Asphaltum coated, service weight, cast iron hub and spigot pipe and fittings with resilient neoprene push-on joints, ASTM A72, ASTM C564-70.
2. Above Ground Piping
   a. No-hub Schedule 40 steel pipe with Husky SD-4000 4-band soil pipe couplings by Anaheim Foundry or Clamp-All Hi Torq 125 2-band clamp or equal. Scaling gasket shall be neoprene in accordance with ASTM C564, CISPI 301-75.

D. Equipment and Cooling Coil Drainage Pipe
   1. Piping shall be same as that specified for water piping.

E. Sump pump and sewage ejector discharge piping shall be galvanized Schedule 40 steel with cast iron drainage pattern screwed fittings. Lab waste ejector piping shall be pressure rated Schedule 40 fire retardant polypropylene with socket fused joints.

PART 3 – EXECUTION

3.01. SOIL, WASTE, VENT AND STORM WATER PIPING INSTALLATION

A. Pipe shall be plumb and parallel to building walls, beams, and columns. Horizontal lines are to be evenly pitched and properly secured with iron or steel hangers. A pitch of 1/4" per lineal foot shall be maintained on soil, waste, and rainwater lines wherever possible. Where long runs of piping require less pitch due to space restrictions, a less pitch shall be allowed on main lines 4" and over in size, but in no event should any pipeline have a slope less than 1/8" per linear foot. Conceal piping in finished rooms unless shown or specified otherwise.

B. No hub cast iron pipe couplings shall be installed as follows:

   1. Place gasket on the end of the pipe and the stainless steel clamp assembly on the end of the other pipe.
   2. Firmly seat the pipe ends against the integrally molded shoulder inside the neoprene gasket.
   3. Slide the clamp assembly into position over the gasket and tighten the bands using a properly calibrated torque wrench, set at 60 inch pounds. Tighten the bands alternately and firmly, first the inner bands, then the outer bands.

C. Service weight cast iron piping below ground shall be installed as follows:

   1. Piping laid in trenches shall be continuously supported on undisturbed or compacted earth. Hand excavate at the bell to allow barrel to bear loading, not the bell.
   2. Lay pipe to a straight line and uniform grade between point where changes in grade or alignment occur. Check line and grade frequently. Keep a stopper in the pipe end when pipe laying is not in progress. Commence at lowest point in the system and work upwards.
   3. Carefully clean interior joint surfaces before joining sections. Firmly insert spigot end into bell completely.
   4. Excavation and backfill are specified elsewhere. Insure that the backfill is carefully packed around the piping as it is being laid, and that the backfill operation is carried in 6" tamper layers to a point at least 12" above the piping.

D. Soil and waste pipes shall be carried out full size through the roof or connected to a common vent above the fixture and as shown on the drawings. Extend vents a minimum 12” above roof. Vent through roof shall be flashed and counterflashing using 4 pounds per square foot sheet lead flashing extended in minimum of 10 inches in direction from the pipe and 14 inches above the roof. Counterflashing shall be turned down inside the top of the pipe and overlap the lower flashing by 4 inches.

E. The main stacks of back ventilation shall run parallel and as close as possible to the soil pipe stacks and shall connect to the vent continuation of the soil stack at least 6" above the rim of the highest plumbing fixtures on the stack; vent stacks shall also be dripped into the bottom of the soil stack through a 'Y' and 1/8 bend on an upright 'Y' fitting. Offsets in vent pipe shall be made with 45° fittings wherever possible. Horizontal vent lines shall pitch back toward a waste line.

F. Threaded joints shall have American National taper screw thread with graphite and oil compound applied to the male threads.

G. Piping to be run straight and plumb and offsets shall be made at an angle of not less than 45° and threaded joints shall be as specified above.

H. Carefully lay out the work in advance so that the pipes will pass through the opening and permit the proper pitch to the pipelines. Due to the extensive system of ventilation and lighting systems, it will be necessary for trades to properly coordinate their work with the work of other trades so as to avoid the necessity of taking down work installed without prior checking. Flush out and clean existing soil and waste piping buried within the existing building prior to making any new connections.

I. Provide and connect cleanouts with brass caps and screws same size as pipe up to 6" and not less than 6" for larger piping at the ends of branches on soil and waste piping, and in such other portions of the piping where run is over 50’-0". Underfloor cleanouts shall be installed as detailed.

J. Where stacks enter drains near walls or piers causing difficult access to end cleanouts, there shall be a vertical cleanout on the stack just above the floor with a 1/4 bend at the foot of the stack.

K. Where such conditions occur in walls or partitions, the cleanout cover shall be accessible through an opening left in the wall and covered with the flush chrome plated brass plate or access panel securely fastened in place.

L. Brass cleanouts shall be solid nut construction.

M. Provide the Owner with wrench for removing cleanout plugs.

N. Where test tees are installed at the base of the stack, or on the stack, they may be used as a cleanout.

O. Provide stack cleanouts 6” above finish floor on all floors.

3.02. TESTING OF PIPING SYSTEMS

A. General

1. Piping systems shall be subjected to testing with water, gas or air as noted and shall hold tight at the pressure head stated for the time interval required without adding air or water. While any system is being tested, required head or pressure shall be maintained until joints are inspected.
2. Tests shall be witnessed by the Owner Representative, with 48 hour notice given.
3. Provide equipment, material and labor required for testing any of the various systems or any part thereof.

B. Sanitary, Specialty Waste and Vent and Storm Water: Water test shall be applied to drainage systems either in their entirety or in sections as required, after piping has been installed. If applied to the entire system, openings in the piping system shall be tightly closed, except the highest opening, and the system filled with water to point of overflow. If the system is tested in sections, each opening shall be tightly closed except the highest opening in the section under test, and each section shall be filled with water but no section shall be tested with less than a 10’-0" head of water. In testing successive sections at least the upper 10’-0" of the next preceding section shall be tested so that no joint of piping in the building, except the uppermost

10’-0" of the system, shall be submitted to a test of less than a 10’-0" head of water. The water shall be kept in the system for at least thirty (30) minutes before inspection starts; the system shall then be made tight.

1. Any points of the drainage systems to be tested with air instead of water shall be made by attaching an air compressor testing apparatus to any suitable opening and after closing other inlets or outlets, forcing air into the systems until there is a uniform gauge pressure of 5 psi or sufficient to balance a 10" Hg high column. This pressure shall be held without the introduction of additional air for a period of at least thirty (30) minutes.

C. Defective Work: If inspection or tests show defects, such defective work or material shall be replaced and inspection and tests shall be repeated. Repairs to piping shall be made with new materials. No caulking of screwed joints or holes will be acceptable.

3.03. CONNECTIONS TO EQUIPMENT

A. Furnish and install waste, vent and indirect waste piping for final connections to sinks, waste, vent and indirect waste piping, casework and emergency stations provided under other Sections. Roughing for this equipment shall be as indicated on the drawings.

B. Obtain exact roughing in dimensions from manufacturers of service locations before connecting to or roughing for equipment.

C. Contractor furnished equipment shall be set under other sections. Provide roughing for and final connections including piping. Conduct final/correct coordination of equipment based on actual and approved shop drawings. Equipment included shall be:

1. Performed sink tops
2. Glass washer
3. Ice machine
4. Owner furnished equipment

END OF SECTION

SECTION 23 04 30
PLUMBING SPECIALTIES

PART 1 – GENERAL

1.01. WORK INCLUDED

A. The work shall include labor, materials, tools, equipment, transportation, insurance, temporary protection, supervision and incidental items essential for proper installation and operation, even though not specifically mentioned or indicated on the drawings but which are usually provided or are essential for proper installation of systems related to this Section, as indicated on the drawings and specified herein.

B. The specifications and drawings describe the minimum requirements that must be met for the installation of work as shown on the drawings and as specified hereinunder.

C. Shop drawings.

D. Field acceptance testing.

1.02. RELATED SECTIONS

A. Examine drawings and criteria sheets and other Sections of the Specifications for requirements which effect work under this Section whether or not such work is specifically mentioned in this Section.

1.03. REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as follows:

1. Material standards shall be as specified or detailed hereinafter and as follows:

a.	ANSI	American National Standards Institute
b.	ASME	American Society of Mechanical Engineers
c.	ASTM	American Society of Testing Materials
d.	ASTM B88-78:	Wrought Copper Fittings
e.	AWS	American Welding Society
f.	CS	Commercial Standards, U.S. Dept. of Commerce
g.	FM	Factory Mutual
h.	FS	Federal Specification, U.S. Government
i.	MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
j.	UL	Underwriters Laboratories, Inc.
k.	OSHA	Occupational Safety and Health Act
l.	ASPE	American Society of Plumbing Engineers

1.04. SUBMITTALS

A. Refer to Div.1 – SUBMITTALS.

B. Prepare and submit shop drawings in accordance with the requirements of the General Conditions and Supplementary Conditions and in the manner described therein, modified as noted hereinafter.

C. Submittals: The following documents shall be provided:

1. Expansion tanks
2. Vacuum breakers
3. Pressure gauges
4. Thermometers
5. Hose bibbs
6. Wall hydrants
7. Backflow preventers
8. Floor drains, roof drains, area drains and planter drains
9. Cleanouts
10. Trap primers
11. Unions
12. Water hammer arrestors

1.05. QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL.

PART 2 – PRODUCTS

2.01. FLANGES

A. Flanges shall be companion type, faced and drilled for not less than 125# steam working pressure complete with necessary adapter, and shall be of the size and material as the adjacent piping.

2.02. UNIONS

A. Provide union connections to fixtures and equipment. Union connections include compression fittings, grooved couplings and flared fittings.

1. Unions on copper piping shall be bronze minimum working pressure of 200 psi.
2. Unions on steel and iron piping shall be ferrous ground joint brass to iron, rated for the working pressure of the system.

2.03. HOSE BIBBS

A. Hose Bibb-HB-1: Chicago 952 or equal, chrome plated brass, 3/4" with non-removable vacuum breaker and loose tee handle.

2.04. BACKFLOW PREVENTION DEVICES

A. Reduced Pressure Backflow Preventers

1. 2" and Smaller: Febco 825Y or equal, bronze body, stainless steel check seats, unions, strainer and shutoff valves. Device shall be listed for hot water temperatures.

2. 2 1/2" and Larger: Febco 825YD or equal, FDA approved epoxy coated cast iron check valved bodies with bronze seats and epoxy coated cast iron relief valve with stainless steel trim OS&Y gate valves and strainer. Device shall be listed for hot water temperatures.
3. Provide an air gap fitting and full size indirect waste to receiver.
4. Device shall comply with CPC, 603.4.17.

B. Double Check Valve Assembly

1. 2" and Smaller: Febco 805Y or equal, bronze body, reducible seats, unions, strainer and shutoff valves.
2. 2 1/2" and Larger: Febco 805YD or equal, epoxy coated, cast iron, bronze seats and stainless steel trim, flanged, strainer and shutoff valves.
3. Device shall comply with CPC, 603.4.17.

C. Provide test kit and spare parts for each type of installed unit. Provide inlet and outlet pressure gauges on units.

D. Pressure Vacuum Breaker

1. Finished areas and locations unless otherwise noted: Febco 765 or equal, compact, chrome plated with integral shutoff valves.

E. Vacuum Breaker

1. For Hot or Cold Water: Febco 710 or equal, bronze, atmospheric vent, chrome plated in exposed, finished areas.

2.05. WATER HAMMER ARRESTERS

A. Hard drawn copper body, brass piston, threaded connector. Seal lubricant shall be FDA approved for potable water. Sioux Chief, Precision Plumbing Products (PPP), Amtrol, Watts or equal water hammer arrestors shall be installed on water supply lines to flush valves and to plumbing supply piping connected to equipment equipped with fast acting valves to control water hammer. They shall be sized and selected in accordance with PDI Standard WH201 with access through approved access panels. Individual locations which require water hammer arrestors are as follows:

1. Flushometer valves
2. Self-closing faucets
3. Prior to pressure reducing valves
4. Prior to in-line solenoid valves

2.06. DRAINAGE SPECIALTIES

A. Before setting any drains, cleanouts or wall plates, obtain from the Contractor the exact information relative to the finished grades of the top of the drains, equipment locations and partition locations. Drainage specialties shall be of the size noted on the drawings and shall be equal to the figure numbers scheduled below. Figure numbers are based on J. R. Smith Co. and Zurn Manufacturing Co. Drainage Specialties may also be manufactured, in compliance with these specifications, by Wade, or equal.

B. Cleanouts

1. Cleanouts shall be furnished and installed at locations required by California Plumbing Code, in accessible locations, 6” above finish floor on all floors, at the bottom of soil and waste stacks, and other locations shown on the drawings and at each change of direction. Cleanouts shall be brought up to finished floor. Outlets shall be caulked or no hub type.
2. Cleanouts occurring in floors finished with quarry, ceramic tile, brick or granite shall be equipped with flush scoriated round bronze as selected by Owner’s Representative to coordinate with color of flooring covers with round frames, as manufactured by to J.R. Smith #4046 or equal. Covers shall be adjustable in height.
3. Cleanouts occurring in resilient tile floors or carpeted areas shall be equipped with flush round metal covers with frames, as manufactured by J.R. Smith #4146 or equal for tile and #4026 or equal, for carpet, with covers recessed to receive tile or carpet. Covers shall have adjustable height.
4. Cleanouts occurring in floors finished with plain concrete shall be equipped with heavy duty flush scoriated round cast iron covers with round frame as manufactured by J.R. Smith #4226 or equal. Covers shall be adjustable in height.
5. Where cleanouts occur under the floors in unexcavated areas, they shall be brought up flush with the finish floor and fitted with a cover as manufactured by J.R. Smith #4226 series or equal, cast iron top.
6. Cleanouts occurring in floors protected with membrane waterproofing shall be same as above, except with integral clamping collar.
7. Cleanouts occurring in walls shall be equipped with flush smooth white metal covers, with 10 inch by 10 inch openings in square frames having anchoring lugs, as manufactured by J.R. Smith #4735, or equal
8. Otherwise exposed or accessible cleanouts shall be as manufactured by J.R. Smith #4420 or #4531 or equal, as required to suit the conditions at each point of application.
9. Extension pieces and bodies of cleanouts shall be of cast iron and arranged to suit each condition of application.
10. Metal specified above shall be solid "nickel-bronze" having high nickel content, appearance of satin chrome, and corrosion and wear resistance qualities greater than bronze.
11. Cleanouts shall be the full size of the pipelines to which they are directly connected, but need not be larger than 4 inches for pipe lines up to 10 inches, and shall be at least 6 inches for pipe lines 10 inches and up.
12. Cleanouts occurring in floors finished with plain concrete shall be equipped with heavy duty flush scoriated round cast iron covers with round frame as manufactured by J.R. Smith #4340, or equal. Covers shall be adjustable in height.
13. Grade cleanouts shall be Zurn #1456, or equal, with inside caulk mounted in cast iron 12" square frame and cover as manufactured by LeBaron #S512 or equal.

C. Floor Drains (FD)

1. Floor drains shall be the product of one manufacturer such as Zurn Industries, J.R. Smith, Wade , Josam or equal.
2. Provide "deep seal" traps for floor drains, of the same material as the piping systems connected thereto.
3. Drains located in waterproofed floors of composition materials or of other kinds, shall be fitted with required flanges, clamping devices and trim required to assure watertight conditions, and they shall be made watertight. Provide other miscellaneous devices, as required, for a complete installation as approved by the Owner’s Representative.
    a. FD-1: Toilet Rooms and Shower Rooms
        1) Zurn Z-415 or Josam floor and shower drain, dura-coated cast iron body with bottom outlet, combination invertible membrane clamp and adjustable

collar with Type H polished, nickel bronze strainer with flashing clamp device. Toilet room floor drains shall be equipped with trap primers.

b. Type B: Mechanical Rooms
   1) Zurn –541, 12" diameter top drain, dura-coated cast iron body with bottom outlet, seepage pan and combination membrane flashing clamp and frame for anti-tilt heavy duty slotted grate with suspended sediment bucket. Provide with trap primer.

c. Type D: Ice Machines
   1) Zurn Z-415 floor drain, dura-coated cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with Type E polished, nickel bronze strainer with 4" diameter funnel.

d. Type F: NMR Trenches
   1) Zurn Z-1723, 4" x 12" medium duty drain, shallow body, 304 stainless steel with bar grate, and trap primer. Mount in bottom of formed concrete trench.

2.07. TRAP PRIMERS

A. Individual fixtures shall be primed by Sloan VBF-72-91, Precision Plumbing Products, Inc., model Prime Rite, or equal. Device shall be machined brass with no springs or diaphragms. Mount 12" above trap to be primed.

B. Multiple fixtures shall be primed by Precision Plumbing Products, model PF-4 through 30 or equal and rated for quantity of traps to be served. The priming manifold shall be capable of supplying 2 oz. of water per trap supply at 20 psig every 24 hours. The device shall be factory assembled and prepiped complete with ball valve, water hammer arrestor, copper barrel hammer arrestor, copper barrel with piston, solenoid valve and ½" trap primer connections. Electronic connections include single point 120V, manual override switch breaker, timer with relay. Unit shall be factory tested and supplied in a wall mounted 16 gauge steel cabinet.

2.08. THERMOMETERS

A. Thermometers shall be adjustable angle design of the separable well type and shall have a 9" cart aluminum case. The scale shall be white with black figures and graduations embossed on the scale. The column shall be filled with red reading mercury. Thermometers shall be manufactured by Trerice Co. or Taylor Instruments.

B. Thermometers shall be furnished complete with all necessary sockets, wells, connectors and accessories required for installation suitable for the service in which installed. Extension necks shall be furnished for insulated piping.

C. Thermometers shall be furnished with the temperature ranges of 30° to 100°F for cold water, and of 30° to 240° for hot water systems.

2.09. PRESSURE GAUGES

A. Pressure gauge shall have a brass movement, aluminum case, double strength clear glass window with black embossed figures and graduations on a white dial face, with 1% accuracy of scale range. Gauges shall be manufactured by Terirce Co., Taylor Instruments, or Marshaltown Mfg.

B. Gauges shall be furnished with snubbers and needle valve shutoff valves.

C. Gauges shall be 4 ½" diameter furnished with ranges that will locate the intended pressure at the point of application approximately midpoint on the range scale. Gauges for natural gas,

vacuum and similar low pressure systems shall be gauges specifically designed for low pressure applications.

PART 3 – EXECUTION

3.01. PLUMBING SPECIALTIES INSTALLATION

A. Install water hammer arrestors at fast operating valves and these locations where there is an anticipated extreme change in velocity so as to cause water hammer. The units are to be installed off the top of the piping system in accessible locations.

3.02. CONNECTIONS TO EQUIPMENT

A. Furnish and install waste and vents, traps, domestic cold and hot water, piping, shutoffs, backflow preventers, pressure reducing valves, vacuum breakers, shock absorbers, regulators and flexible tubing for final connections to kitchen and laundry equipment, casework and sinks provided under other Sections. Roughing for this equipment shall be as indicated on the drawings.

B. Obtain exact roughing in dimensions from manufacturers of service locations before connecting to or roughing for equipment. Provide shutoff valves at each piece of equipment.

C. Contractor furnished equipment shall be set under other Sections. Provide roughing and final connections including piping. Conduct final/correct coordination of equipment based on actual and approved shop drawings. Equipment included shall be:

3.03. BACKFLOW PREVENTERS AND APPROVALS

A. Potable water piping outlets and connections to equipment shall be protected with an air gap or backflow preventer approved by the Department of Environmental Protection Agency or Board of Health. Installation, clearances and equipment shall be in strict accordance with California Plumbing Code.

B. Submit plans and obtain approval for each reduced pressure backflow preventer installation. Provide certification for these assemblies confirming proper operation and settings. Copies of approvals shall form a portion of the record drawings.

C. Reduced pressure backflow preventers shall be installed with inlet and outlet gauges, strainer and indirect waste through an air gap to a floor drain or receiver.

END OF SECTION

SECTION 23 04 40
PLUMBING FIXTURES

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Fixtures and equipment shall be supported and fastened in a satisfactory manner. Where wall hung fixtures are secured to masonry walls or partitions, they shall be fastened with minimum 1/4" through bolts provided with nuts and washers at back. Bolt heads and nuts shall be hexagon, and exposed bolts, nuts, washers, and screws shall be chromium plated brass.

1.02 RELATED SECTIONS

A. Examine drawings and criteria sheets and other Sections of the specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.03 TOILET ACCESSORIES

A. Attention is directed to other sections of the General Specifications. Toilet room accessories, including grab bars, shall be furnished under other sections of the Specifications. The labor for installing toilet room accessories and all back-up material of wood, fasteners, hangers, brackets, etc. shall be by the Contractor. Reference shall be made to Architectural Specifications and drawings for exact quantity, type and locations of toilet accessories. Accessories must be properly fastened with special attention given handicapped persons grab bars which must be anchored in accordance with manufacturers instructions. Store accessories until required on job.

1.04 SUBMITTALS

A. Refer to Div.1 – SUBMITTALS.

B. Prepare and submit shop drawings in accordance with the requirements of the General Conditions and Supplementary Conditions and in the manner described therein, modified as noted hereinafter.

C. Submittals – The following documents shall be provided:

1. Plumbing fixtures.

1.05 QUALITY ASSURANCE

A. Refer to Div.1 – QUALITY CONTROL.

PART 2 – PRODUCTS

2.01 FIXTURES

A. Fixtures shall be Crane, Kohler, Eljer, American Standard Company or equal and shall be installed complete with trimmings and fittings. Plumbing fixtures shall be provided as scheduled on the drawings. Refer to architectural drawings for exact elevation, number and location of fixtures.

B. Fixture Trim and Accessories: Provide fixtures complete with trim and accessories which shall include fixture carrier, faucet, drain outlet, strainer, escutcheons, bolt caps, tailpiece, P-trap, stops, supplies and interconnecting piping for foot pedals faucets, to provide proper operating fixtures and equipment.

1. Finish: Trim exposed to view shall be polished chrome plated.
2. P-Traps: Traps shall be cast brass adjustable ground union joint elbow and cast brass slip nuts. Trap arm extension shall be I.P.S. threaded brass nipple.
3. Drain Outlets: Provide drain outlet of the same manufacturer as the fixture or faucet trim with chrome plated cast brass plug with 17 gauge minimum weight tailpiece. Provide 1 1/4" tailpiece on lavatories and 1 1/2" on sinks.
4. Stops and Supplies: Chrome plated, brass with loose key stop, and IPS threaded inlet. Treaded pipe nipples shall be IPS brass or copper pipe adapter shall be sweat x M.I.P. Compression fittings are not permitted. Manufacture shall be Chicago faucet, Brass Craft “H” series or equal. Supply pipe risers shall be rigid copper tubing ASTM B-68 with brass nuts and couplings.
5. Carriers: Provide floor mounted fixture supports for wall mounted fixtures. Fixture support shall support at least 250 lbs. for (5) minutes. Zurn, JR Smith, Wade or equal.
6. Water stops, riser and trap assembly shall be insulated with premolded PVC covering conforming with A.D.A. regulations. Manufacturer shall be McGuire Prowrap, Truebro or equal.

C. Water Conservation: Provide water conserving fixtures and trim compliance with the following maximum water use requirements. Provide variable pressure flow controls on showers, sinks and lavatory faucets.

D. Water Closet

Refer to ‘Plumbing Fixture Schedule’ on the drawing.

E. Lavatory

Refer to ‘Plumbing Fixture Schedule’ on the drawing.

F. Sink

Refer to ‘Plumbing Fixture Schedule’ on the drawing.

PART 3 – EXECUTION

3.01 SPECIAL FITTINGS

A. Wall hung fixtures shall be supported on combination wall hung supporting fitting and chair carrier furnished complete with special foot piece and necessary bolts, nuts, washers and gaskets. The adjustable nipple for water closets between the cast iron fitting and the closet bowl shall be per manufacturer’s recommended fitting. Secure foot pieces to floor slab.

B. Maintain 1/16" clearance between finished wall and back of closet and follow manufacturer's details in installing couplings

3.02 FIXTURE ROUGHINGS

A. Install rough plumbing, including fixture carriers and supports, valves and water hammer arrestors within chase tolerances. Supply roughing through finish walls and at hose bibbs and shower heads shall be secure and free of movement. Locate valves and water hammer arrestors within 12" of approved access panel location.

B. Align exposed waste and supply pipe roughings with fixture connections within 1" tolerance. Provide flush valves in alignment with the fixture, without vertical or horizontal offsets. Obtain fixture manufacturer roughing data sheets for recommended roughing dimensions.

C. Provide fixture templates for Contractor for counter mounted sinks and lavatories.

D. Secure fixture supports to floor slab construction with lag bolts and metal expansion shields to support at least 250 lbs. for (5) minutes.

E. Provide fixture rough-in piping connection sizes in accordance with the drawing schedule.

END OF SECTION

SECTION 23 08 50
FANS AND ACCESSORIES

PART 1 – GENERAL

1.01. WORK INCLUDED

A. Furnish and install fans of the various types, arrangement and sizes as specified herein and as scheduled on the drawings.

B. Products specified under this Section shall include:

1. Centrifugal Fans
2. Roof Curbs

1.02. RELATED SECTIONS

A. Examine drawings and other Sections of the Specifications for requirements which affect work under this Section, including the following:

1. 23 00 10 – Mechanical General Provisions
2. 23 00 50 – Basic Mechanical Materials and Methods
3. 23 08 91 – Ductwork.

1.03. REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as following:

1. AMCA 99 – Standards Handbook; 1986.
2. AMCA 210 – Laboratory Methods of Testing Fans for Rating Purposes; 1985.
3. AMCA 261 – Directory of Products Licensed to Bear the AMCA Certified Ratings Seal; 1995.
4. AMCA 300 – Test Code for Sound Rating Air Moving Devices; 1994.
5. AMCA 301 – Method of Publishing Sound Rating Air Moving Devices; 1994.
6. NEMA MG 1 – Motors and Generators; 1993 (and Revision 1).
7. UL 705 – Power Ventilators; 1994.

1.04. SUBMITTALS

A. Refer to Div. 1– SUBMITTALS.

B. Submit certified curves showing fan performance with system operating points plotted on curves.

C. Submit motor data sheets including motor efficiency and power factor at various loadings of nameplate horsepower. Motor efficiency and power factor shall be shown for 100%, 75% and 50% of nameplate horsepower. Submit data on efficiency and power factor required for motors 1 HP and above only. Motors shall have premium efficient motors as specified in Section 15170.

D. Submit bearing sizing calculations for each similar size and type of fan. Fan bearing calculations shall be based on fan at maximum operating conditions including belt pull. Calculations shall be done for both fan bearings and motor bearings. Calculations required on centrifugal fans, vent sets in-line fans, wall mounted propeller fans and vane axial fans only.

E. Submit sound power levels for each size and type of fan. Sound levels shall be in all (8) octave bands for discharge of fan, inlet to fan, and radiated noise through casing.

F. Submit certified shop drawings indicating dimensional data, and operating and maintenance clearances.

1.05. QUALITY ASSURANCE

A. Refer to to Div. 1– QUALITY CONTROL

B. Qualifications

1. Manufacturers must have documented experience in the production of similar products of this type for more than ten (10) years.

C. Quality Standards

1. Fans shall conform to most recent AMCA Bulletins regarding construction and testing. Fans shall be tested and rated per AMCA and shall be selected in proper operating range without motor overloading and fan surge.

2. Fans shall be air and sound certified in accordance with AMCA 210 and 300 and shall bear the AMCA seal.

3. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. and other testing firm acceptable to the authority having jurisdiction and suitable for the purpose specified and indicated.

1.06. SELECTION AND BALANCING

A. Furnish and install items as listed in equipment schedules, as shown on drawings, and as specified.

B. Provide fans capable of accommodating static pressure variations of ±10%.

C. Provide balanced variable sheaves for motors 7.5 HP and under, and fixed sheaves for 10 HP and over.

D. Statically and dynamically balance fans in the field to eliminate vibration or noise transmission to occupied areas of the building. Provide certificate of compliance from manufacturer.

E. Provide OSHA belt guards on interior mounted belt driven fans. Provide weatherproof ventilated housing for exterior mounted fans.

F. Provide special construction fans such as sparkproof, explosionproof, or coated fans as required by the schedule.

G. Provide safety, bird or insect screen where inlet or outlet is exposed.

H. Fans shall be manufactured in accordance with this specification even where techniques are required which are not considered standard by that manufacturer.

I. Verify fan arrangement, including motor location for servicing and discharge arrangements for proper airflow.

J. Where fixed speed sheaves are specified for a particular fan, provide (2) additional sheaves as necessary for final air balancing.

K. The fan manufacturer shall install and adjust the linkages for controllable and manually adjustable pitch vaneaxial fans in the field. Field adjustment of the pitch range shall be provided by the fan manufacturer, to balance the fan to maximum and minimum conditions. Field adjustment of the adjustable pitch setting shall be provided by the fan manufacturer, to balance the fan to the required conditions.

1.07. PAINTING

A. Each fan component shall be thoroughly cleaned, degreased and deburred before the application of a rust preventive primer.

B. Two (2) coats of a rust preventive primer shall be applied under a top coat of air dried epoxy or enamel. Minimum coating thickness shall be 3 to 5 mils. The final coat shall be applied after final assembly to all surfaces.

C. Aluminum parts do not require painting.

PART 2 – PRODUCTS

2.01. MANUFACTURERS

A. Centrifugal Fans (Housed and Unhoused/Plug Type)

1. Loren Cook Co.
2. Greenheck Fan Corp.
3. ACME Fan Corp.
4. Trane
5. Twin City Fan Co.
6. New York Blower

B. Or equalTubular In-Line Centrifugal Fans

1. Greenheck Fan Corp.
2. Loren Cook Co.
3. ACME Fan Co.
4. Trane
5. Or equal

C. Square In-Line Centrifugal Fans

1. Greenheck Fan Corp.
2. Loren Cook Co.
3. ACME Fan Co.
4. Trane
5. Or equal

D. Snorkel Booster Exhaust Fans

1. Buffalo
2. Or equal

E. Vane Axial Fans
1. New Philadelphia Fan Co.
2. Woods Fan Co.
3. Greenheck Fan Corp.
4. Or equal

F. Gravity Relief Hoods
1. Greenheck Fan Corp.
2. Loren Cook Co.
3. ACME Fan Co.
4. Trane
5. Or equal.

2.02. ACOUSTICAL REQUIREMENTS

A. All sound power level measurements and calculations shall be made in complete accordance with the latest version of AMCA Standard 300. The testing laboratory shall be AMCA-Certified to perform the test. Calculated or estimated sound power levels are not acceptable. Alternative sound power level measurement methods are acceptable if approved in advance by the Architect.

B. The octave band sound power levels in decibels re 1 picowatt (10^{-12} watts) shall not exceed the values given in the Schedule below when the fan is operating at the design airflow and static pressure conditions. Calculated or estimated sound power levels are not acceptable.

2.03. CENTRIFUGAL FANS

A. General

1. Centrifugal “housed” type fans shall be belt drive, used for all scheduled “SWSI” and “DWDI” supply and exhaust fans. Centrifugal “unhoused/plug” type fans shall be belt drive, used only in the return air handling unit.
2. Fan selection and ratings shall be based on tests made in accordance with ASHRAE 51 and AMCA 210 and shall be licensed to bear the AMCA seal.
3. Fans shall be minimum Class I construction and labelled UL 705.
4. Fans shall be backwardly inclined, airfoil, or flat blade type with a minimum of (10) blades.
5. Fans shall have sharply rising pressure characteristics at the operating point specified and shall be quiet and stable in operation. Horsepower characteristics shall be self-limiting and at peak value at the specified operating point.
6. The specified fan RPM, outlet velocity, and trip speed are the maximum acceptable. The motor horsepower, CFM, and static pressure are the minimum acceptable.
7. Fan arrangements shall be minimum AMCA pressure class, single-width, single-inlet or double-width, double-inlet, clockwise or counter-clockwise rotation shall be as scheduled on the drawings and as coordinated in the field.
8. Each fan shall be fully assembled with motor and drive on a structural steel base and run tested at the factory prior to shipment of the unit. Testing shall be conducted at the operating speed or maximum fan class speed. The total fan assembly shall be checked for balance and compared against the acceptable levels on the Rathbone Chart. The amplitude of vibration (displacement in mils) at operating speed measured at each unit fan bearing shall not exceed the values given in the following table:

Fan RPM	Displacement Mils
500	4.2
800	3.0
1100	2.3
1400	1.9
1700	1.6

Note: Displacement shall be peak-to-peak in X, Y and Z directions.

B. Fan Base

1. Fan with motor and drive shall be mounted on a structural steel base having a minimum 6" depth.
2. The base shall be electrically welded, and after welding, the base shall be cleaned, primed and painted to match fan coating.
3. Base steel sizing and construction shall be sufficient to allow the entire assembly to withstand the rigors of shipping and rigging.
4. Base shall be provided with lifting lugs and motor slide rails.
5. Fans with inertia bases as indicated in equipment schedules on mechanical drawings shall have structural bases constructed to accommodate concrete after installation. Bases shall be in accordance with Section 15240.
6. Bases shall be constructed with gusseted brackets to accommodate field installed spring isolators as specified under Section 15240.

C. Fan Housing (Housed Centrifugal Fan Only)

1. Fan housing shall be heavy gauge continuous welded steel construction with fan scroll and bearings supported from a structural steel framework. Minimum gauge construction shall be as indicated in the material construction schedule.
2. Fan housing shall be suitably braced to prevent vibration and pulsation.
3. Fans having wheel diameters 36" and larger shall have horizontally flanged split housings as required for installation.

4. Fan housing and inlet shall be constructed to allow the fan wheel(s) to be removed through the inlet opening when the inlet cone is removed.
5. A quick opening clean out door, shaped to conform with the scroll contour shall be provided with heavy duty latches.
6. A 1/2" tapped 3/4" diameter pipe coupling drain connection shall be welded to the fan scroll at the lowest point.
7. Fans shall be convertible to a minimum of (8) standard discharge arrangements.
8. Fans shall be provided with a flanged discharge. Provide matching companion flange in the field.
9. Fan cut-off shall be provided to deliver good pressure distribution.
10. A weatherproof housing shall be provided with ventilation grilles to cover motor and drive assembly for exterior mounted fans.

D. Fan Inlet and Wheel Cone

1. Precision die spun or formed, and matched inlet and wheel cones shall be provided for streamlined airflow into the wheel to ensure full loading of the blades.
2. Inlet and wheel cones shall be hyperbolic. Radial side sheets are not acceptable.
3. Inlet cone shall be heavy gauge steel bolted to fan housing to allow for removal.
4. Fans having duct connected inlets shall be provided with a flanged inlet collar with matching companion flange.
5. Fans which are not duct connected shall be provided with inlet screen(s). Inlet screen(s) shall be a nominal 1" by 1" mesh fabricated 10 gauge steel.
6. Hubs shall be straight bored, keyed and set screwed to shaft for positive attachment. Hubs shall be securely riveted to the backplate or center plate.
7. Bushed hubs are not acceptable.
8. Double width double inlet fans shall be a single wheel of the common center plate design or (2) single-width single-inlet wheels back to back, each keyed and set screwed to a common shaft.
9. Fan blades shall be continuously welded to the inlet hub and the backplate.
10. Wheel center plate or backplate shall be heavy gauge steel construction with a minimum gauge as indicated in material construction schedule.
11. The fan shaft shall be solid AISI C-1018, 1040 or 1045 hot rolled steel, accurately turned, ground and polished, and ring gauged for accuracy.
12. Recommended bearing manufacturer tolerances must be met in the contact area for bearings.
13. Shafts must be dial indicator inspected for straightness after the keyways are cut.
14. Fan shaft shall be coated with a rust inhibitive coating.
15. Fan wheel shall be statically and dynamically balanced prior to fan assembly.
16. The entire rotating assembly shall be designed so the first critical speed is a minimum of 25% greater than the fan design speed.

E. Fan Shaft Bearings

1. Fan bearings shall be foot mounted type, bolted on a rigid welded steel framework integral with the housing.
2. Bearings shall be sized for a minimum L-10 life of 200,000 hours at maximum fan class operating conditions including belt pull. Bearings shall be selected in accordance with standards set forth by the Anti-Friction Bearing Mfrs. Assn. (AFBMA).
3. The bearings shall be double-row spherical, self-aligning, grease lubricated, roller bearings housed in a horizontally split pillow block housing.
4. Bearings shall be SKF-SAF Series 22500, Linkbelt P-B22400H, or equal.
5. Extruded copper grease leads shall be provided to an easily accessible location.

F. Fan Drive

1. Fans shall be belt driven unless otherwise specified. The drive shall be a multiple V-belt type sized for 1.65 times the fan motor horsepower. Sheaves shall be fixed or adjustable based on fan motor horsepower as specified hereinbefore. The fan sheave shall have a tapered lock, split and keyed hub.
2. Motors shall meet requirements specified in Section 15170.
3. Motors shall be 1800 rpm for belt driven fans and direct driven fans.
4. An OSHA approved type fan drive guard shall be provided with provision for RPM measurement, without removing the guard. The guard shall be made of 1/2" 16 gauge flattened expanded steel, wrapped around a 16 gauge channel frame suitably braced to prevent vibration. Paint guard with coating similar to fan.
5. Fan belts shall be oil resistant 24,000 hour non-static belts.

G. Fan Material Construction Schedule

1. The following schedule indicates minimum allowable steel gauge thicknesses for construction:

Housing				Wheel			
Wheel Size	AMCA Pressure Class	Side Sheet	Scroll	Blades	Wheel Cone	Back-plate	Center-plate (DWDI)
12	1	12	14	16	10	8	8
thru	2	10	12	16	10	8	8
22	3	10	10	16	10	8	8
24	1	12	14	16	10	8	8
thru	2	12	14	16	10	8	8
33	3	8	10	16	10	8	1/4
36	1	12	14	16	10	8	8
	2	12	14	16	10	8	8
	3	8	10	16	10	8	1/4
40¼	1	12	12	14	10	8	8
thru	2	12	12	14	10	1/4	1/4
44½	3	8	10	14	10	1/4	1/4
49	1	12	12	12	10	8	8
	2	12	12	12	10	1/4	1/4
	3	8	10	12	10	1/4	1/4
54¼	1	12	12	12	8	8	1/4
	2	12	12	12	8	1/4	5/16
	3	8	10	12	8	1/4	3/8
60	1	12	12	12	8	3/16	1/4
	2	12	12	12	8	3/8	3/8
	3	8	10	12	8	3/8	3/8
66	1	8	8	10	1/4	3/16	5/16
	2	8	8	10	1/4	3/8	3/8
	3	8	8	10	1/4	3/8	3/8
73	1	8	8	8	1/4	1/4	5/16
	2	8	8	8	1/4	3/8	3/8
	3	8	8	8	1/4	3/8	3/8

2. Manufacturers shall use their standard gauges if heavier than those indicated above. Information on standard construction shall be made known if requested by the Owner's Representative.

2.04. ROOF CURBS

A. Roof curbs shall be factory fabricated, acoustical type, constructed of 16 gauge aluminum, preinsulated and protected from erosion.

B. Curbs shall be fabricated to match roof structure elevation and provide level surface for equipment installation.

PART 3 – EXECUTION

3.01. COORDINATION

A. Coordinate the fan arrangement with the coordinated ductwork layout prior to ordering the fan. Provide labor and materials necessary to change fan arrangement in the field when fan arrangement does not match ductwork.

B. The inlet and discharge ductwork shall have a minimum straight run of (2) fan diameters upstream and downstream of the fan. Notify the Owner's Representative in writing if these conditions cannot be achieved. Installation of improper inlet/discharge conditions without the review of the Owner's Representative shall be corrected in the field at no cost to the Owner.

C. The discharge duct arrangement shall comply with AMCA recommended layouts for elbows after fans.

D. Provide supplemental steel, supports, rods and hangers necessary to hang or mount fans. Supports shall include thrust restraint as required by the fan manufacturer.

E. Receive and inspect fans and motors to make sure that fans are received without defect. All defective or damaged fans shall be replaced at no additional cost to the Owner.

F. Protect equipment to prevent damage from water, dirt, and accident. Protection shall include temporary plastic wrap to keep equipment in original factory condition. Fans used for temporary ventilation during construction shall be totally cleaned and refurbished prior to turnover to the Owner.

G. Install and vibration balance all fans. Furnish and install power wiring to the fan motor and verify proper fan rotation. Coordinate the starter requirements to ensure that the proper starter is installed for non-standard motors. Provide all interlock wiring to the fan, including smoke detector wiring for fan shutdown, as specified in Section 17000.

H. Provide automatic control dampers for fans. Damper actuators shall be as specified in Section 17000.

3.02. FAN INSTALLATION

A. Fans shall be installed in accordance with manufacturer recommendations, Contract Drawings and reviewed submittals.

B. Provide vibration isolation and seismic restraints in accordance with the requirements of Sections 15240 and 15245.

C. Install floor mounted fans on 6" high concrete housekeeping pads as specified in Division 3. Coordinate final pad size and location in the field.

D. Install roof mounted centrifugal fans on steel platform with walkable grating and access ladder as specified in Division 5. Unless noted otherwise, platform shall be 2'-0" above roof surface. Coordinate final size and location in the field.

E. Furnish roof curbs for roof mounted mushroom and up-blast fans for installation as specified in Division 7.

F. Install suspended fans with supports attached to structural members.

G. Fans shall be installed so as to ensure easy accessibility for service or removal or replacement of components such as, fans, motors, belts, drives, bearings, dampers, actuators, isolators, and field connections.

H. Install motors and drives shipped loose. Fans shall be installed and tested, and shall be made fully operational.

I. Provide fixed sheaves as necessary for final air balancing.

J. Manufacturer shall include the adjustment of pitch for adjustable pitch fans as required by balancing.

K. Provide roof curbs and counterflashing. Coordinate installation with the requirements of Division 7.

L. Make penetrations through roof or vertical walls watertight. Submit methods of sealing to the Owner's Representative for review.

M. Fans shall have flexible inlet and outlet couplings to prevent vibration transmission to ductwork.

N. Assemble all loose parts including motors and drive assemblies on site and shall vibration balance the fans in the field. Field adjustment including belt alignment, wheel balancing, belt tension, greasing of bearings, installation of belt guards, and other loose parts shall be provided.

3.03. RELIEF HOOD INSTALLATION

A. Relief hoods shall be installed in accordance with the manufacturer's recommendations, Contract Documents, and reviewed submittals.

B. Furnish roof curbs for roof mounted relief hoods for installation as specified in Division 7.

3.04. ROOF CURB INSTALLATION

A. Roof curbs shall be installed in accordance with the manufacturer's recommendations, Contract Documents, reviewed submittals..

END OF SECTION

SECTION 23 08 91
DUCTWORK

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Furnish and install sheet metal, including accessories as indicated on the drawings and required for a complete an operable air distribution system.

B. Products specified under this section shall include:

1. Ductwork and fittings for all pressure classifications and materials.
2. Flexible ductwork.
3. Bellmouth connections.
4. Shop applied duct liner.

C. Create, coordinate and submit 3/8 inch scale Coordination Drawing in accordance with Section 15010 – Mechanical General Provisions.

D. Ductwork shall be fabricated and installed in accordance with SMACNA Duct Construction Standards.

E. Refer to Part 3 for sheet metal installation requirements.

1.02 RELATED SECTIONS

A. Examine drawings and other Sections of the Specifications for requirements which affect work under this Section, including the following:

1. 23 00 10 – Mechanical General Provisions
2. 23 00 50 – Basic Mechanical Materials and Methods
3. 23 08 92 – Ductwork Accessories

1.03 REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material and installation standards shall be as specified or detailed hereinafter and as follows:

1. ASTM A 666 – Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 1994a.
2. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 1995.
3. ASTM B 209M – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 1995.
4. NFPA 90A – Installation of Air Conditioning and Ventilating Systems; 1993.
5. NFPA 91 – Exhaust Systems for Conveying of Materials; 1995.
6. SMACNA (LEAK) – HVAC Air Duct Leakage Test Manual; 1985.
7. SMACNA (DCS) – HVAC Duct Construction Standards – Metal and Flexible; 1995.
8. UL 181 – Factory-Made Air Ducts and Connectors; 1994.
9. AWS Standards D1.1, D1.3, D1.4 and D9.1
10. California Building Code, 1998.
11. California Mechanical Code, 1998.

12. California State Fire Marshal.

1.04 SUBMITTALS

A. Refer to to Div. 1–SUBMITTALS.

B. Product Data: Provide data for duct materials, duct connectors and accessories, including:

1. Duct fabrication standards.
2. 3/8 inch scale sheet metal fabrication drawings with all accessories.
3. Hanger and support systems.
4. Vibration isolation equipment.
5. Fabrication drawings and calculations approved by a qualified Registered Structural Engineer for all seismic hangers and support systems other than SMACNA or NUSIG systems.

C. Duct fabrication standards and methods of installation shall be in compliance with SMACNA and these specifications, clearly indicating the combination of metal gauges and reinforcement intended for use for each pressure classification. Duct fabrication shall not be allowed until a satisfactory review of the duct fabrication standards, has been performed.

D. Prepare and submit 3/8 inch scaled ductwork coordination drawings for all floors and systems in accordance with Section 15050, Submittals.

E. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA (LEAK) – HVAC Air Duct Leakage Test Manual.

F. Duct leakage testing shall be performed with the Owner's Representative and Inspector in attendance.

G. Project Record Documents: Record actual locations of ducts, duct fittings and all accessories. Record changes in fitting location and type. Show additional fittings used.

1.05 QUALITY ASSURANCE

A. Refer to to Div. 1– QUALITY CONTROL.

B. Qualifications

1. Ducts and fittings shall be manufactured by a sheet metal fabrication company with more than ten (10) years documented experience in the manufacture of commercial and industrial quality ducts and fittings.
2. Sheet metal installer shall have more than ten (10) years experience in fabricating and erecting ductwork of the types required for this project, as well as successful experience with projects of similar scope.

PART 2 – PRODUCTS

2.01 GENERAL

A. Unless otherwise specified herein or noted on the drawings, construct ducts, plenums and accessories of galvanized sheet steel per SMACNA 1995 Duct Construction Standard (DCS), Tables 1-3 through 1-13.

B. Duct dimensions indicated on the drawings are clear inside dimensions. The sheet metal dimensions shall be increased to accommodate internal liner where liner is required .

C. The drawings are diagrammatic and indicate the arrangements of the principal apparatus, ductwork and piping and shall be followed as closely as possible. Because of the scale of the drawings, it is not possible to show all offsets, rises, drops, rises, fittings and accessories. Carefully investigate the structure; finish conditions, and the work of other sections affecting the work and arrange ductwork, piping, equipment and accessories, accordingly. Provide the best possible arrangement so as to provide the maximum headroom and access to apparatus. This work shall be included in the project without extra charge.

D. In addition to sheet metal ductwork provided under this Contract furnish and install, or install as furnished by other sections, accessories and devices including smoke detectors, plenums, canopy hoods and blank off panels at unused louver areas.

E. Duct systems specified to be installed under this Contract, shall conform to the drawings, specifications, Standards, details and recommendations of the latest Edition of SMACNA "HVAC Duct Construction Standards - Metal and Flexible"; and "Round and Industrial Duct Construction Standards" (hereinafter referred to as Duct Manual). Where the requirements under this Section exceed the requirements of the Duct Manual, the specification shall govern. Wherever the word "should" appears, replace with the word "shall".

F. Submit duct fabrication standards and methods of installation, in compliance with SMACNA and these specifications, for review by the Owner’s Representative, clearly indicating the combination of metal gauges and reinforcement intended for use for each pressure classification. Duct fabrication shall not be allowed until a satisfactory review of this Standard has been performed.

G. Galvanized steel sheet metal shall conform to ASTM A653 (G-90) having not less than 0.45 oz. of zinc on each side of each square foot of sheet. Other duct materials shall be as hereinafter specified as applicable to this Contract.

H. Install duct mounted smoke detectors, furnished under Division 16.

I. Furnish and install intake and exhaust plenums attached to louvers.

J. Joint Sealing

1. Refer to SMACNA DCS, Table 1-2 for duct sealing requirements.
2. Sealant: water based elastomeric compound, gun or brush grade, maximum 25 flame spread and 50 smoke developed (dry state) specifically for sealing ductwork. Use products as recommended by manufacturer for low, medium, or high pressure systems.

3. Provide liquid sealant, with or without compatible tape, for low clearance slip joints and heavy, permanently elastic mastic type where clearances are larger. Oil base caulking and glazing compounds are not acceptable. Design Polymeric #1020 or Duro Dyne DSW, or equal.
4. Tape: Use only tape specifically designated by the sealant manufacturer. SMACNA recommends that foil tape not be used and that pressure sensitive tape not be used on bare metal surface or on dry sealant.
5. Gaskets: For flanged joints use manufacturers recommendation.
6. Duct sealant shall be applied to all joints, seams, tape, fittings and connections to VAV terminals and ceiling supply return and exhaust registers.

K. Factory made joints such as Ductmate or TDC Lockformer duct joint systems are acceptable provided test reports certify that they are equivalent to SMACNA Standards.

L. Rectangular duct longitudinal seams shall be Pittsburgh lock 3/8” minimum pocket.

2.02 DUCT SYSTEMS

A. Duct Construction Schedule

Minimum SMACNA Construction Standards						
Ductwork Location	Pressure Class Inches W.G.	Seal Class	Leakage Class	Material	Sound Lining	Notes
Supply from AHU or RTU or ACU to outlets	+2	A	4	G-90	No	
Return from inlets to AHU or RTU or ACU	-2	A	4	G-90	No	--
Transfer ductwork	±2	C	12	G-90	No	1
Toilet exhaust	-3	A	4	G-90	No	1
Plenums	±2	A	4	Same as Ducts	No	1
Other	±2	A	4	G-90	No	1

Table Notes

B. No ductwork shall be constructed to less than 2 inches w.g.

C. The minimum gauge for any steel duct shall be 24 gauge.

D. The minimum gauge for any stainless steel duct shall be 18 gauge.

E. The minimum thickness of any aluminum duct shall be 0.040".

F. The minimum diameter of any tie rod shall be 1/2".

G. The maximum tie rod spacing shall be 42" unless specifically engineered in accordance with the SMACNA Industrial Rectangular Duct Standard.

H. Tie rods shall not be used in any plenum or large duct requiring internal access or used as an access pathway.

I. When tie rods intersect, they shall be welded to each other.

J. Ductwork required to be removable shall be companion flanged SMACNA Type T-22 for ductwork constructed to SMACNA Metal Duct Standard and companion flanged in accordance with Industrial Standards for ductwork required to be constructed to Industrial Standards.

K. Radius elbows shall be used wherever possible. Where it is impossible or impractical to install a 1.5 times width to centerline radius of elbow (full radius elbow) lesser radii configurations shall be used, each with "radius-proportional" splitter vanes permanently installed within. No radius shall be less than 1.0 times the width. Provide square elbows in rectangular ducts with double thickness vanes with a minimum radius of 4 1/2". Square elbows may only be used when radius elbows will not fit and where specifically reviewed by the Owner's Representative prior to fabrication and/or as required by coordination shop drawings.

L. Toilet and general exhaust ductwork shall be constructed of G-90 galvanized sheet metal, except as hereinbefore specified.

M. All joints and seams in ductwork and casings shall be sealed airtight with a coating of sealing compound applied all over and around each potential point of leakage so as to ensure airtightness. In finished areas, sealing compound shall be neatly applied to exposed ductwork and bands shall be provided over, to cover the sealant.

1. Sealants, adhesives and coatings shall be of approved kinds and qualities for each point of application, complying with recommendations for the use and storage.
2. The method of installation and materials for sealing the ductwork shall be submitted for review by the Owner's Representative, as part of the ductwork construction standards and installation submittal.

N. It is the intent of this specification to provide a duct system with minimum resistance to airflow. Take-offs shall be throated and transitions made as gradually as possible. "Bullhead" or sharp take-offs shall not be acceptable.

2.03 BELLMOUTH CONNECTIONS

A. General

1. Manufacturer of Bellmouth connections shall be Buckley Associates, United McGill, Semco, or equal.
2. Bellmouth fitting shall be constructed to match material requirements of the "Duct Construction Schedule" For galvanized (G-90) duct, minimum material thickness shall be 24 gauge. Stainless steel bellmouth shall be minimum 18 gauge.
3. Bellmouth shall have a minimum radius of 1-1/2 inches with ½ inch flange and ½" x 1/8" thick neoprene gasket.
4. Bellmouth connection to duct main shall be made with gasket, sheet metal screws, and duct sealant.

2.04 SHOP APPLIED DUCT LINER

A. Use of duct liner shall be limited to double wall exhaust plenum.

B. All shop applied duct lining shall conform to the following:

1. Interior supply and return ducts and plenums (other than outside air plenums), as hereinbefore specified to have internal duct insulation shall be lined with 1" thick fiberglass duct liner equal to Manville Permacote Linacoustic R300. Liner shall meet the requirements of UL 181, ASTM C665 Bacteriological Standards, UL 723 Flamespread and NFPA 90A for flamespread and smoke developed ratings as borne out by tests and ratings of UL. Liner shall have an NRC no less than 0.80, based on Type A mounting as tested in accordance with ASTM C423-90 "k" factor not to exceed 0.25 (1") at 75°F mean temperature in accordance with ASTM C-518.
2. Maximum air friction in straight 24" diameter duct conveying 6200 cfm airflow at 2000 fpm velocity shall be 0.36" per 100'-0".
3. No erosion of insulation material shall occur below 5000 fpm duct velocity. Rigid board liner shall be constructed of strong glass fibers bonded with thermosetting resin. All surfaces shall be protected with an acrylic coating.
4. Liner shall be applied with 100% coverage of approved fire resistant adhesive. Ducts over 20" in size in any direction shall be secured with mechanical fasteners ("stick-clips") on 12" centers and within 3" of ends. Leading and exposed edges of liner joints shall be coated with fire resistant adhesive. Permacote-coated surface shall face the airstream.
5. The ductwork system shall be lined/sealed and installed in a manner to allow for low temperature air operation. Care shall be exercised to ensure that no gaps or bare sheet metal exist, which might create condensation.
6. Acoustical liner installed in medium pressure ductwork and wherever lining starts abruptly from unlined ductwork shall be "nosed" with sheet metal flanging at all joints in accordance with SMACNA liner nosing details.
7. Liner shall be coated with a surface coating that does not support the growth of fungus or bacteria as determined by tests in accordance with ASTM C1071 and ASTM G21 and G22. Liner shall be sound absorptive.
8. The smooth black surface of the liner shall face the airstream and top pieces shall support the side pieces.
9. Lining on double wall duct systems shall be completely covered with a layer of perforated minimum 24 gauge sheet metal (3/16 sq.in. holes on 7/16" staggered centers). The perforated sheet metal inner liner shall be secured with rivets and washers at intermediary points maximum 12" on center on all spans greater than 12" in width or height. Sheet metal nosing shall be provided to cover all insulation exposed-to-airstream edges, by bending of the sheet metal liner. Other methods of nosing, if different than the one specified, shall be submitted for review by the Architect prior to installation.

PART 3 – EXECUTION

3.01 SHEET METAL INSTALLATION

A. General

1. Contractor may vary run and shape of ducts and make offsets during progress of work, if required to meet structural or other interferences, as approved by the Owner’s Representative.

2. Install ductwork in adherence to ceiling height schedules indicated. Establish necessary space requirements so as to maintain required clearances around all equipment.
3. Reinforce all ducts to prevent buckling, breathing, vibrations or noise. Such reinforcing shall be as recommended in the reference specified herein.
4. Coat galvanized areas of fittings damaged by welding with a corrosion-resistant aluminum paint or galvanized repair compound.

B. Ductwork Installation

1. Ducts shall be constructed and supported per SMACNA 1995 DCS with exceptions as noted in these specifications. Fittings, joints, branches, dampers, and fasteners shall be per SMACNA Standards, except as noted herein.
2. The size of the ducts indicated on the drawings shall be net inside dimensions.
3. All uninsulated ducts over 18” shall be cross broken or beaded.
4. Ducts shall be braced, reinforced and supported with galvanized steel angles.
5. Seams and Joints: Longitudinal seams shall be Pittsburgh lock with 3/8” minimum pocket. Button punch snap lock per Figure 1-5 of SMACNA Standards will be unacceptable.
6. Branch connections per Figure 2-6 of SMACNA Standards shall be 45° entry type with Clinch Lock connections. Straight tap or butt flanged connections are not acceptable.
7. Air volume control on parallel flow branches shall be by branch dampers. Splitter type dampers will not be acceptable.
8. 90° tees and laterals or round ducts shall be 45° lateral or 90° tee with oval to round tap, per Figure 3-4 of SMACNA Standards. 90° tee fitting or 90° tap will not be acceptable. Conical tees per Figure 3-5 will be acceptable.
9. Powder actuated fasteners or friction clamps attached to steel members as shown in Figure 4-1 and 4-2 of SMACNA Standards will not be acceptable. Approved beam clamps firmly secured to the steel member with retaining clips will be acceptable as shown in SMACNA Figure 4-3, item 6a.
10. Bands with single hanger will be unacceptable on ducts greater than 24” diameter.
11. Pipe penetration of casings shall be sealed with a continuous weld per Figure 6-10 of SMACNA Standards. Mastic sealant will not be acceptable.
12. All ductwork shall be supported and anchored to the structure so that horizontal ducts are without sag or sway, vertical ducts are without buckle and all ducts are free from deformations, collapse or vibration.
13. Ductwork shall be installed to true alignment, generally parallel or perpendicular to adjacent building walls, floors and ceilings, so as to present a neat and workmanlike appearance.
14. Care shall be paid to the exact locations of sheet metal work with respect to equipment, ducts, conduits, piping, slabs, beams, columns, ceiling suspension systems, lighting fixtures and electrical, plumbing and fire protection systems in the building. Close coordination and cooperation shall be exercised with other Sections in locating the piping and equipment in the best interests of the Owner. The drawings and specifications covering other work to be done in the building shall be carefully studied and arrangements shall be made to avoid conflict.
15. The drawings shall be followed where they are definite and provided such procedures do not cause objectionable conditions for equipment provided installed under this Contract. The drawings are intended to indicate the sizes of ductwork and if certain sizes are omitted or unclear, obtain additional information before proceeding.

16. Locate and size openings for ductwork in the building construction. Provide sleeves as hereinbefore specified.
17. Provide access doors in ductwork at the following locations:
    a. Upstream of in-duct reheat coils
    b. Fire/smoke dampers
    c. Both sides of filters
    d. Otherwise indicated or specified
18. Provide labels with a minimum of 1" high red letters on white background. Each access door shall be labeled as follows:
    a. Fire/Smoke Damper
    b. Automatic Damper
    c. Coil Access
19. The installation of special items of equipment in the duct systems, including automatic dampers, thermostats, thermometers, duct airflow measuring devices and other related controls, shall be done under the direct supervision of the manufacturer of such controls.
20. Elbows, tees and branch takeoffs in round ductwork shall be made of the same materials as the ductwork.
21. Duct connections to equipment shall be in no case smaller than the equipment openings.

C. Duct Hangers and Supports
1. Provide suitable angle iron/strap hangers and supports inside the mechanical shafts, mechanical rooms and in ceilings of the buildings, and on the roof(s) as shown on the drawings.
2. This work shall be performed as required by job conditions and as instructed by the Owner's Representative in the field to support air distribution ductwork and devices in both horizontal and vertical planes.
3. When hanging and supporting the ductwork, the following shall be complied with:
    a. Except as otherwise noted, ductwork up to 42" in greatest dimension shall be hung by using hanger sheet metal bands secured as a minimum at (2) locations to the vertical sides of the ductwork and at (1) location under the duct. Support systems shall be compatible with the building structure and roofing system as reviewed by the Owner's Representative.
    b. Where ductwork major axis dimension is larger than 42", ductwork shall be hung by using hanger rods of not less than 3/8" soft steel secured to angle iron trapeze support frame around ductwork with threaded nuts for securement and adjustment. Rods used on ductwork exposed in finished spaces shall be plain smooth rods threaded only at the ends.
    c. Ductwork shall be securely attached to the building construction. The hanger design and spacing shall be governed by the major duct dimension and shall be in accordance with SMACNA Duct Manual, except as modified hereinbefore. Vertical ductwork shall be supported at each floor level in an approved manner using angles or channels attached to the ducts. The installation, when complete and under operating conditions, shall be free from chatter or vibration. If necessary to achieve this, additional supports and/or bracing shall be furnished without extra cost to the Owner. Supports and bars and similar items shall be primed and painted structural steel. Touch up with aluminum paint any surfaces where galvanizing is destroyed on indoor ductwork, zinc primer on exposed ductwork with a final coat of aluminum paint.

d. Provide supplemental steel required to support the ductwork in shafts, mechanical rooms or on the floor where structural steel is not properly positioned. Beam clamps shall be double sided.

e. The maximum hanger spacing of 10'-0" on centers and additionally on each side of an elbow or change-in-direction fitting.

f. In addition to the above, provide supports on each side of any duct mounted device, i.e., fans, coils and fire/smoke of automatic dampers), to permit removal of the device without disconnecting adjacent duct sections.

g. Provide angle sway bracing to the structure wherever lateral loads would be imposed on the ductwork, including but not limited to elbows downstream of fan discharges, and to ductwork exposed to the weather, subject to wind loads.

h. Ductwork mounted on the roof or otherwise exposed to the elements shall be supported with frames constructed of steel angles and channels regardless of duct size. Counterflashing of duct penetrations through roof shall be provided under this Contract. Provide diagonal cross bracing between supports as required to sustain maximum area wind loads as dictated by the Owner's Representative.

C. Additional Installation Requirements

1. Openings for pitot tube traverses shall be fitted with neat removable plugs or caps. As a minimum, such openings shall be provided at every fan inlet and at such other points as may be required for airflow measuring and balancing. Coordinate the location of plugs and caps with the testing, adjusting and balancing scope of work.
2. Where applicable and as reviewed by the Owner's Representative, exposed ductwork shall be installed in a workmanlike manner to result in a neat appearance with no visible penetrations, screws, or other sheet metal imperfections.
3. Install all UL listed devices in accordance with their listing.

3.02 SHEET METAL TESTING

A. General

1. Ductwork that is required to be tested shall be tested on regular intervals as the job proceeds and shall be completed prior to enclosure in shafts, above ceilings or behind walls.
2. Keep an up-to-date log of the ductwork tested for review by the Owner's Representative.
3. Furnish and install blank off plates, blind flanges and safing, necessary to isolate each section of duct being tested for leakage.
4. Submit for review proposed testing procedures, sample report, and equipment to the Owner's Representative prior to proceeding. In addition, notify the Owner's Representative when testing is to occur so that the test can be witnessed at the Owner's Representative's option.
5. Test equipment shall be calibrated per ANSI Standards prior to testing. Certified test reports shall be submitted to the Owner's Representative prior to commencement of the testing.
6. Testing Procedure

a. The testing procedure shall be in accordance with SMACNA "HVAC Air Duct Leakage Test Manual".
b. The test pressure shall be the specified construction pressure of the duct system.

B. Scope of Testing

1. Ductwork (regardless of pressure class) that will be in inaccessible areas including, ducts within shafts, above hard ceilings, and those that will be made inaccessible by the work of other Sections. (This shall include ±2" w.g. construction.)
2. Ductwork constructed to greater than +2" w.g. or less than -2" w.g.
3. Other sheet metal in duct systems constructed to ±2" w.g. shall be tested under normal fan pressure and shall not leak sufficiently to cause audible leaks or blowing detectable by hand. If, in the opinion of the Owner's Representative, the ductwork does not appear to be constructed and/or sealed to the reviewed shop standards, the Owner's Representative may request any or all of this ductwork to be tested at the specified construction pressure.

C. Allowable Leakage

1. The total allowable leakage shall be less than specified leakage class with no audible leaks.
2. If no leakage class is listed elsewhere, the system shall meet leakage Class 4.

3.03 CLEANING

A. Clean duct interiors of debris.

B. Cover open ends of duct when installation does not proceed for more than one day.

END OF SECTION

SECTION 23 08 92
DUCTWORK ACCESSORIES

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Furnish and install sheet metal accessories as indicated on the contract drawings and required for a complete and operable air distribution system.

B. Products specified under this section shall include:

1. Duct access doors.
2. Flexible connectors.
3. Fire dampers, smoke dampers and combination fire smoke dampers.
4. Balance dampers.
5. Registers, grilles and diffusers.

C. Refer to Part 3 for installation requirements.

1.02 RELATED SECTIONS

A. Examine drawings and other Sections of the Specifications for requirements which affect work under this Section, including the following:

1. 23 00 10 – Mechanical General Provisions
2. 23 00 50 – Basic Mechanical Materials and Methods
3. 23 08 91 – Ductwork

1.03 REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as follows:

1.	NFPA 90A:	Installation of Air Conditioning and Ventilating Systems; 1993.
2.	NFPA 90B:	Installation of Warm Air Heating and Air Conditioning Systems; 1993.
3.	SMACNA (LEAK):	HVAC Air Duct Leakage Test Manual; 1985.
4.	SMACNA (DCS):	HVAC Duct Construction Standards – Metal and Flexible; 1995.
5.	UL 181:	Factory-Made Air Ducts and Connectors; 1994.
6.	ADC 1062:	Test Coe for Grilles, Registers and Diffusers
7.	AMCA 500:	Test Method for Louvers, Dampers and Shutters
8.	ASHRAE 70:	Method of Testing for Rating the Airflow Performance

1.04 SUBMITTALS

A. Refer to Div. 1–SUBMITTALS.

B. Product Data: Provide data for all sheet metal accessories.

C. Sound attenuator test data shall be as follows:

1. Sound attenuator ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test sound attenuator in accordance with ASTM E477. The test setup and procedure shall be such that effects due to end reflection, directivity, flanking transmission, standing waves, and test chamber sound absorption are eliminated.
2. Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) power levels both for forward flow (air and noise in same detection) and reverse flow (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity. Ratings must be published catalog values, factory certified on printed forms, not typewritten on blank forms.
3. Static pressure loss of sound attenuators shall not exceed those listed in the sound attenuator schedule as the airflow indicates. Airflow measurements shall be made in accordance with ASTM E477 and applicable portions of ASME, AMCA and ADC airflow test codes. Tests shall be reported on the identical units for which acoustic data is presented.
4. With submittals, the manufacturer shall supply certified test data on DIL, SN Power Levels and Aerodynamic Performance for reverse and forward flow test conditions. Test data shall be for a standard product including the performance effects caused by the encapsulation film and acoustic standoff material. Rating tests shall be conducted in the same facility and shall utilize the same sound attenuator for the acoustic and the aerodynamic tests. The certifying laboratory shall be open to inspection upon request from the Owner's Representative.

1.05 QUALITY ASSURANCE

A. Refer to Div. 1 – QUALITY CONTROL.

B. Qualifications

1. Ducts and fittings shall be manufactured by a sheet metal fabrication company with more than ten (10) years documented experience in the manufacture of commercial and industrial quality ducts and fittings.
2. Sheet metal installer shall have more than ten (10) years experience in fabricating and erecting ductwork of the types required for this project, as well as successful experience with projects of similar scope.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Access Doors in Ductwork

1. Air Balance
2. Ductmate
3. Or equal

B. Flexible Connectors

1. Ventlock
2. Ventglass
3. Or equal

C. Fire/Smoke Dampers

1. Ruskin

2. Air Balance
3. Greenheck Fan Corp.
4. Or equal

D. Balancing Dampers (OBD)

1. Ruskin
2. Greenheck Fan Corp.
3. Or equal

E. Small Balancing Damper less than 48x12

1. Ventlock
2. Duro Dyne
3. Or equal

F. Registers, Grilles, Diffusers

1. Tuttle & Bailey
2. Titus
3. Or equal

2.02 ACCESS DOORS IN DUCTWORK

A. Provide access doors and frames in supply, exhaust and return ductwork as required, to permit access to automatic dampers, in-box heating coils, combination fire/smoke dampers, in-duct coils and other similar equipment, as well as for cleaning and inspection purposes. Doors shall match material type and heaviest gauge of the duct system in which they are installed. Access doors shall be as follows:

1. General purpose access doors shall be of double wall construction of not less than 20 gauge sheet metal and shall be neoprene gasketed around their entire perimeter. Doors in insulated ducts or insulated casings shall be covered with fiberglass insulation of type to match adjacent ductwork or casings. Insulation between the metal panels shall be of the same thickness as the duct or panel adjacent to the access doors.
2. Access doors shall be hung on heavy hinges and shall be secured in the closed position by means of cast zinc clinching type cam latches. Where space conditions preclude hinges, (4) heavy window type latches shall be utilized, in addition to a retainer chain.

B. Combination fire/smoke dampers access doors in supply ductwork of +3" w.g. or greater construction, in addition to the requirements above, shall be of the pressure relief (negative pressure) type, complete with secure retainer chain and "D" handle. These doors shall be mounted downstream (after shutoff) of fire dampers and/or smoke dampers or similar automatic shutting devices. These doors shall be of the automatic reset type.

2.03 DAMPERS

A. General

1. The minimum damper requirements shall be as indicated in the following table:

Damper Construction Table						
Type	Approach Velocity (FPM)	Pressure Rating	Instantaneous Pressure Rating	UL 555S Leakage Class	Blade Type	Listing
Balancing dampers in ducts wider than 48" and/or deeper than 12" (VD or as specified)	2,500	4" w.g.	N/A	N/A	OBD	N/A
Balancing damper in ducts less than 48" by 12" (VD or as specified)	2,500	2” w.g.	N/A	N/A	OBD	N/A

B. Combination Smoke/Fire Dampers

1. General
   a. Combination smoke/fire dampers shall be provided as shown on the drawings and wherever Architectural drawings indicate fire and/or smoke rated partitions. Devices shall be of the appropriate service for the partition class into which they are installed. Exact requirements and type of partition shall be coordinated with the Owner’s Representative.
   b. Dampers shall meet the requirements of NFPA 90A and further shall be tested, rated and labeled in accordance with UL 555, (6th Edition), UL 555S (4th Edition), and UL 555C (1st Edition).
   c. Each damper shall be rated to close against maximum design airflow at its installed location, with a 400 fpm and 0.5 in. w.g. safety factors and against 4" w.g. maximum pressure across the closed damper.
   d. Dampers of all ratings and types shall be of the nominal 100% face area type, with blade package and frame components out of the airstream. These dampers shall include the required oversize enclosures which shall be sealed by the damper manufacturer for the appropriate duct pressure class into which they are installed. Such dampers shall have appropriate rectangular, flat oval or round duct collars to facilitate connection of mating ductwork. The Contractor shall be responsible for any additional sealing of duct collars and connections required to maintain the duct seal class requirements, but shall not jeopardize the UL breakaway connection when utilized.
   e. Indicate the location and rating of all dampers on shop drawings and provide access doors at each location of sufficient size and type to permit access to the damper linkage. A list of fire dampers shall be provided for review. Coordinate locations of duct access doors and dampers.
   f. Include damper manufacturer's installation instructions as part of the damper submittal. These instructions shall describe the applicable requirements for damper sleeve thickness; retaining angles; sealing; duct-to-sleeve connections; preparation of wall, floor or ceiling openings; and other requirements to provide an installation equivalent to that tested by the damper manufacturer during the UL 555, UL 555S, and UL 555C qualification procedures. Detail any proposed installations that deviate from these manufacturer's instructions and explain the needed deviations. Fire and smoke damper installations shall comply with the

manufacturer's installation instructions. Any submitted deviations must be approved by the Owner's Representative.

g. Dampers in welded ductwork shall have rigid connections to penetration sleeve(not breakaway). Refer to manufacturer approved installation details.

2. Combination Fire/Smoke Dampers

a. Combination fire/smoke dampers shall be provided as shown on the drawings and wherever architectural drawings indicate smoke/fire rated partitions.

b. Combination fire/smoke dampers and actuators shall meet the requirements of NFPA 92A and NFPA 92B and further shall be tested, rated and labeled as a "Leakage Rated Damper for Use in Smoke Control Systems" in accordance with the 4th edition of UL 555S. Smoke dampers shall be of low leakage design qualified to UL 555S Leakage Class I (maximum leakage of 4 cfm/sq.ft. at 1" w.g. and 8 cfm/sq.ft. at 4" w.g.) and shall have a UL 555S elevated temperature rating of 350°F minimum. Each smoke damper/actuator combination shall be UL 555S rated to operate at maximum design airflow at its installed location with 400 fpm and 0.5 in. wg. safety factors.

c. Each combination fire/smoke damper shall be supplied with an appropriate damper actuator installed by the damper manufacturer at the time of damper fabrication. Combination fire/smoke dampers shall be manufactured with a metal sleeve of appropriate length and thickness for the required damper installation, and the damper actuator shall be installed on the sleeve exterior. Damper actuators shall be pneumatic type.

1) Interlock to fire alarm system to affect the sequence of operation shall be as specified in Division 17.

2) Dampers shall be fail closed as follows:

a) Air to Damper: Open

b) No Air to Damper: Closed

d. Damper frame shall be galvanized steel formed into a structural hat channel shape with reinforced corners. The blades shall be airfoil type. Bearings shall be stainless steel sleeve turning in an extruded hole in the frame. Blade edge seals shall be silicone rubber designed to withstand 450°F and jamb seals shall be stainless steel flexible metal compression type.

e. Each damper shall be equipped with a remote open or closed indication feature consisting of (2) DPDT switches linked directly to a damper blade and colored pilot lights ([1] switch to activate at the damper open position [green] and [1] to activate at the closed position [red]).

1) These switches shall be furnished by the damper manufacturer, and installed and wired as specified in Division 16, in a location approved by the Owner's Representative.

2) Spare contacts shall be provided for additional remote (fire panel) operation.

f. Each combination fire/smoke damper shall also be equipped with a temperature limited re-openable feature providing the following operational sequence:

1) Temperature at damper reaches 165°F or 50°F above highest system temperature, whichever is greatest, and primary heat sensing device closes damper. Remote or local override command panel can then re-open damper.

C. Volume Dampers

1. Volume dampers shall be provided at each branch duct and as indicated on drawings for supply air duct systems, return air duct systems and exhaust air duct systems.
2. Comply with SMACNA Figure 2-12 with continuous rod and closed end bearings regardless of pressure class.
3. Use 3/8" continuous square rad and 18 gauge galvanized stiffened blade for damper blade sizes 18" wide by 18" high and smaller, or 12" diameter and smaller.
4. Use ½" continuous square rod and 16 gauge galvanized stiffened blade for damper blade sizes 19" to 48" wide by 10" high. Maximum blade size is 48" by 10" high. Maximum diameter is 16".
5. Maximum of two blades without a frame: Over two blades, use a manufactured 16 gauge galvanized, stiffened, opposed blade damper in a 14 gauge galvanized steel frame. All hardware shall be galvanized except use brass trunions and bronze olite bearing.
6. Quadrant shall be Ruskin, Prefco or equal.
7. Cut slot in end of damper rod (Quadrant End) to indicate blade position.
8. Provide galvanized sheet metal "hat section" on ducts with exterior insulation so that quadrant will be exposed. Provide tight sealing nylon brushing at duct opening for damper shaft under hat section.
9. Each square rod shall be installed vertical or horizontal so that quadrant will be accessible for adjusting.
10. Provide minimum 24" x 24" access door for each volume damper that is not accessible as approved by the Owner's Representative.

2.04 REGISTERS, GRILLES AND DIFFUSERS

A. General

1. Diffusers, grilles and registers shall be of steel construction, unless otherwise specified herein or scheduled on the drawings.
2. Aluminum and steel diffusers, grilles and registers shall be factory primed and finish painted by the manufacturer in color as approved by the Owner's Representative during shop drawings, unless otherwise noted.
3. Diffuser and registers shall be equipped with opposed blade dampers.
4. Diffusers, registers and grilles shall be compatible with the designed ceiling/wall type. Refer to architectural drawings for exact details of ceiling/wall construction.

B. Acoustical Requirements

1. When tested in complete accordance with ARI Standard 890 by an acoustical laboratory that is ARI-Certified to conduct the test, and when a 10 dB Room Effect Factor has been applied to all of the sound power level values, the resulting Noise Criteria (NC) rating of the air inlets and outlets in each type of room shall not exceed the values given in the table below

Diffusers & Grilles	Maximum NC Rating
Assemby Area/Dining	NC-35
Offices & Conference Rooms	NC-30

Lobby and Corridors	NC-35

C. Wire Mesh Screens

1. Mesh shall be ½” square pattern, 1/16” galvanized wire, interwoven, welded or secured to frame.

2. Frames shall be 1” x by 1” by 1/8” galvanized steel angles for duct sizes through 24”, 1-1/2” x 1-1/2” x 3/16” for duct sizes between 25” to 48”, and 2” x 2” x 3/16” for ducts larger than 48”, continuous around perimeter of screen.

PART 3 – EXECUTION

3.01 SHEET METAL ACCESSORIES INSTALLATION

A. Install sheet metal accessories in accordance with manufacturers’ recommendations, Contract Drawings and reviewed submittals.

B. Refer to Section 15891 for additional ductwork installation requirements.

3.02 AIR DISTRIBUTION DEVICES INSTALLATION

A. Install air distribution devices where shown in accordance with manufacturer's instructions, Contract Documents and reviewed submittals. Coordinate final locations with the Owner’s Representative.

B. Air distribution devices installed in t-bar type suspended ceilings shall be centered on the t-bar grid.

C. Support air distribution devices independent of the ceiling construction.

D. Air distribution devices shall be installed in the ductwork in accordance with the requirements of Section 15891.

END OF SECTION

SECTION 23 09 90
TESTING, ADJUSTING AND BALANCING

PART 1 – GENERAL

1.01 WORK INCLUDED

A. The General Contractor shall procure the services of an independent Testing, Adjusting and Balancing (TAB) Contractor. The TAB Contractor shall provide labor, instruments and materials necessary to completely test, adjust and balance HVAC systems and equipment installed under this contract.

B. Testing shall include the Engineered Smoke Control System as required by CBC 905.

C. Instruments shall be newly calibrated for this specific project.

1.02 RELATED SECTIONS

A. Examine drawings and other Sections of the Specifications for requirements which affect work under this Section, including the following:

1. 23 00 10 – Mechanical General Provisions
2. 23 00 50 – Basic Mechanical Materials and Methods
3. Div. 1 – Quality Requirements

1.03 REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as follows:

1. AABC MN-1 – National Standard for Testing and Balancing Heating, Ventilating and Air Conditioning Systems; 1989.
2. ASHRAE 111 – Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning and Refrigeration Systems; 1988.

1.04 SUBMITTALS

A. Refer to Div. 1– SUBMITTALS.

B. Submit name of testing, adjusting and balancing contractor for approval within 30 days after award of Contract.

C. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting and balancing of systems and equipment to achieve specified performance.

1. Submit under provisions of Section 01400 – Quality Control.
2. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing and equipment data required.
3. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for inclusion in operating and maintenance manuals.
4. Provide reports in letter size, 3 ring binder manual, complete with index page and indexing tabs with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets and indicating thermostat locations.

5. Include detailed procedures, agenda, sample reports forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.
6. Test Reports: Indicate data on AABC MN-1 forms, forms prepared following ASHRAE 111, NEBB forms, or forms containing information indicated in Schedules.
7. Include the following on the title page of each report.
   a. Name of Testing, Adjusting and Balancing Agency.
   b. Address of Testing, Adjusting and Balancing Agency.
   c. Telephone number of Testing, Adjusting and Balancing Agency.
   d. Project name.
   e. Project location.
   f. Project Engineer.
   g. Project Contractor.
   h. Report date.

D. Project Record Documents: Record actual locations of water systems balancing valves and rough setting.

1.05 QUALITY ASSURANCE

A. Refer to Div. 1– QUALITY CONTROL.

B. Qualifications

1. Testing and balancing agency shall be a member of AABC or NEBB with a minimum of ten (10) years of documented experience.
2. An AABC or NEBB certified Testing and Balance Engineer (TBE) shall be responsible for certification of the total work of this section.

C. Quality Standards

1. Work shall be performed in accordance with AABC National Standards. If these specifications set forth more stringent requirements than the AABC National Standards, the more stringent specifications shall prevail.
2. Submit a company resume listing personnel and project experience in the field of air and hydronic system balancing.
3. Submit an inventory and calibration data of instruments and devices in possession of the balancing agency to enable the Owner or his representative to evaluate the balancing agency's performance capability.
4. Submit to the Owner or the Owner's representative, upon acceptance of the contract, an AABC "Quality Assurance Guaranty" dated and signed by the AABC Executive Director.
5. Within (30) days after notice to proceed, submit to the Owner’s Representative, the testing and balancing agency’s working agenda which shall include procedures for testing and balancing each type of air and water system. The Test and Balance Report format will also be submitted indicating data to be recorded.

1.06 DEFINITIONS

A. AABC: The Associated Air Balance Council is a non-profit association of independent, certified agencies specializing in testing and balancing HVAC systems.

B. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers.

C. HVAC: Heating, Ventilating and Air Conditioning.

D. TAB: Testing, Adjusting and Balancing of HVAC Systems to meet design objectives and obtain optimum system performance.

E. TBE: Test and Balance Engineer is an individual certified by AABC as having a degree in Engineering and (3) years of test and balance experience, or (5) years of background in the air conditioning field and (5) years continuous field experience in testing and balancing work. The TBE must also pass the AABC Test and Balance Engineer Certification Examination.

1.07 SYSTEM DESCRIPTION

A. Provide the services of an independent test and balance firm that specializes in testing and balancing of HVAC systems. The following services shall be provided:

1. Preconstruction Plan Check and Review: Review the design documents prior to commencing construction.
2. On-going job site inspections of equipment, controls and metering devices during construction to verify conformance with design specifications.
3. Air System Balance
   a. Supply air systems
   b. Exhaust air systems
   c. Return air systems
4. Special System Testing and Verification
   a. Duct leakage testing
5. System Performance Verification

1.08 CONTRACT DOCUMENTS

A. Within (30) days after selection of the test and balance agency, the Contractor shall provide the agency with the following:

1. Construction Drawings
2. Equipment Specifications
3. Equipment Submittals

B. The testing and balancing agency shall be provided the following as issued or received:

1. Equipment Manufacturer's Submittal Data
2. Mechanical Contractor's Shop Drawings
3. Temperature Control Drawings
4. Project Schedule

1.09 NOTIFICATION AND SCHEDULING

A. A prebalance conference shall be held prior to job start as scheduled by the Owner's Representative. Attendees at the meeting shall include representatives of the test and balance agency, Contractor, Owner and or Owner’s Representative.

B. The schedule for testing and balancing the HVAC system shall be established by the Contractor, in coordination with the testing and balancing agency, and approved by the Owner’s Representative.

C. The testing and balancing agency is responsible for initiating this continuing coordination to determine schedule for final testing and balancing services.

D. It will be necessary for the testing and balancing agency to perform its services in close coordination with the Contractor, with scheduling and deficiencies reported through the Owner's Representative.

E. Before testing and balancing commences, the testing and balancing agency shall receive notification, in writing, from the Contractor that the system is operational, complete, and ready for balancing.

F. A completed system exceeds physical installation. The Contractor shall certify that fans and pumps are installed in good working order, and that full load performance has been preliminary tested.

G. The Contractor shall certify in writing, that equipment has been checked, started, adjusted by the manufacturer, and operated for the specified period of time.

1.010 COORDINATION WITH OTHER TRADES

A. To bring the HVAC system into a state of readiness for testing, adjusting and balancing, the Division 23 Contractor shall perform the following:

1. Air Distribution Systems
   a. Ensure that volume dampers are properly located and functional. Dampers serving requirements of minimum and maximum outside, return and exhaust air shall provide tight closure and full opening, with a smooth and free operation.
   b. Verify that supply, return, exhaust, and transfer grilles, registers and diffusers are installed and operational.
   c. Ensure that fans (supply and exhaust) are operating and free of vibration. Fans and drives shall be checked for proper fan rotation and belt tension. Overload protection shall be of proper size and rating. A record of motor current and voltage shall be made to verify that the motors do not exceed nameplate rating.
   d. Make any necessary changes to the sheaves, belts, and dampers, as required by the testing and balancing agency, at no additional cost to Owner’s.
   e. Install clean filters prior to testing.

PART 2 – PRODUCTS

2.01 INSTRUMENTATION

A. The testing and balancing agency shall furnish necessary calibrated instrumentation to adequately perform the specified services.

PART 3 – EXECUTION
3.01 GENERAL

A. Balance and testing shall not begin until applicable HVAC systems have been completed and are in full working order, as determined by the ’s Representative. Where construction is phased, the TAB Contractor shall submit a plan of action which outlines

how each phase will be balanced and how, when completed, the entire system will be verified to be tested and balanced.

B. The TAB Contractor shall coordinate his work with the HVAC Contractors, shall place all heating, ventilating and air conditioning systems and equipment into full operation, and continue the operation of same during each working day of adjusting and balancing.

C. The TAB Contractor shall perform all tests as hereinafter specified, compile the test data, and submit five (5) copies of the complete test data to the 's Representative.

D. The General Contractor shall award the test and balance contract to the approved agency at the beginning of the construction of the project to allow the TAB Contractor to schedule this work in cooperation with the HVAC Contractor and other Trades involved and comply with completion data and requirements, as well as provide a list of areas where special requirements for balancing devices (dampers, valves) might occur.

E. The TAB Contractor shall provide all testing instruments used for balancing air and water systems. Testing instruments shall have been calibrated within a period of six (6) months prior to balancing. Types, serial numbers and dates of calibration of all instruments shall be listed in the final air and water balance reports herein specified.

F. The Owner's Representative shall be notified minimum five (5) days in advance of proceeding with balancing work to allow time for the witnessing of the testing, balancing and adjusting.

G. The TAB Contractor shall provide all manpower, instruments, temporary connections and all other materials required to accomplish the balancing and testing as hereinafter specified. In the case of phase construction, the action plan shall include an explanation of all temporary facilities and their effect on the overall system.

H. The TAB Contractor shall balance cooling system in the air conditioning season and heating system in the heating season.

I. In the event it becomes necessary to balance the HVAC systems correctly, after the balancing is complete, the cost of this work will be back charged to the TAB Contractor.

3.02 SCHEMATIC SYSTEM DRAWINGS

A. Ductwork Systems
   1. The TAB Contractor shall prepare schematic diagrammatic drawings for the following:
      a. Supply air systems (all units)
      b. All exhaust air systems
   2. The drawings will be 1-line airflow schematics emanating from the air handling equipment, through shafts, to the first major split of duct branches on each floor. The drawings will indicated the air quantities measured at these major branches, pressure drop and any other pertinent information deemed necessary by the Architect.
   3. In addition to the duct schematic drawings, the TAB Contractor shall prepare individual schematic drawings for each air handling unit indicated the pressure drop of each component of the unit, including the discharge plenum and unit duct discharge and shall prepare composite schematic drawing of all "special pressure" rooms or spaces which shall show on one drawing, the supply, and/or exhaust system, flow rates (design and actual) and final offset pressure/CFM.

B. The intent of the required documentation would be to clearly indicate the balancing and performance of the systems as they are installed. Furthermore, the above-required information will be utilized by the Owner for future renovation and/or alterations of the various systems. Therefore, the drawing content and presentation will be submitted to the Owner's Representative for review prior to actual commencement of work. In the case of phased construction, the schematics shall indicate the limit of each phase and any temporary measures taken to obtain system performance.

C. The drawings shall be produced on AutoCAD Release 2020 (or higher), and a disc and one (1) set of reproducible vellums shall be submitted to the through the Architect, for his use. All costs associated with the production of the documents shall be included under the Balancing Contractor's contract.

3.03 TEST FORMS

A. Each sheet shall have the job name and address, the name of the TAB Contractor, , Architect and Engineer, the instruments used to perform the test, and the name of the test Technician, date and time of test, outside db/wb temperatures.

B. All forms shall be submitted on a standard 8 ½" by 11" good quality paper, bound together to form a complete report. All forms shall be submitted in typewritten form; handwritten forms are not acceptable. Cover of first sheet shall list the name of the job and the location of same. Copies of all forms shall be submitted to the Architect for review and acceptance prior to the work beginning.

C. Diffuser, Grille, Register, and All Types of Air Terminal Test Sheets

1. Each sheet shall be arranged in columns and all final sheets shall show the following data:
   a. Room number or area designation.
   b. Outlet code number which shall correspond to code number.
   c. Size of outlet – manufacturer's listed data.
   d. Type of outlet per manufacturer's model designation.
   e. Manufacturer of outlet.
   f. Manufacturer's effective area for each size.
   g. Schedule FPM and required CFM of each outlet, individually for heating and cooling.
   h. Test resultant FPM and CFM of each outlet, individually for heating and cooling.
   i. Testing, setting and report of CFM settings for each box, including pressure drop at each setting.
   j. All rooms/spaces with duct supply and return/exhaust are to have supply, return/exhaust quantities shown on the same sheet. All rooms are to have air quantities for supply, return/exhaust list per individual room. Supply, return/exhaust readings shall be listed sequentially, with final CFM offset, or room pressure clearly identified.

D. Exhaust and Ventilating Fan Test Sheets

1. Each sheet shall contain in two (2) columns, one (1) for specified conditions and one (1) for test conditions obtained.

2. All final sheets shall list the following data:
   a. Exhaust fan system and exhaust fan number.
   b. Fan manufacturer.
   c. Fan curve.

d. Size and model.
e. Motor HP, voltage and phase.
f. Changes made or recommended.
g. Amperage nameplate rating.
h. Final operating amperage.
i. Fan RPM.
j. Total CFM.
k. Suction static, discharge static, total static.

E. Test Code Drawings

1. Each report shall contain a single line drawing or drawings of the air distribution system with the fan system, applicable zoning, etc., indicated. Each and every outlet supply and return shall be indicated on this drawing by a number corresponding to the number of the outlet test sheet.

2. The drawing shall be clean and neat and shall list the name and location of the job.

F. Velocity and Pressure Test Sheets for Main and Branch Ducts

1. Duct location or designation.
2. Duct size.
3. Number of velocity readings.
4. Duct average velocity.
5. Total CFM.
6. Duct average static pressure.

3.04 AIR SYSTEM BALANCING AND TESTING PROCEDURES

A. The Balancing Contractor shall perform the following tests, and balance all systems in accordance with the following requirements after clean filters are installed in all filter banks before tests are performed.

1. Test and adjust blower RPM and blade pitch angle on vane axial fans to achieve design requirements.
   a. Test and record motor full load ampere.
   b. Make pitot tube transverse of main supply, return and exhaust air ducts to obtain design CFM at fans.
   c. Test and report system static pressure, suction and discharge.
   d. Test and adjust system for design CFM recirculated air.
   e. Test and adjust system for design CFM outside air.
   f. Test and record entering and leaving air temperatures (db-wb cooling and db heating).
   g. Adjust all main supply, return and exhaust air ducts to proper design CFM.
   h. Adjust all zones and branches to proper design CFM, supply, return and exhaust systems.
   i. Test and adjust each diffuser, grille, register, and constant volume box to within ±5% of deign requirements.

j. Test and adjust all special pressure rooms to maintain pressure relationship indicated on drawings. Note that air quantities on the drawing may have to be changed to satisfy the pressure relationship.

k. Identify and list size, type and manufacturer of diffuser, grilled register, and terminal volume boxes. Include information regarding coils where applicable.

l. Measure air quantities in main and branch ducts by traversing entire cross sectional area of duct with pitot tube. Ducts have velocities of 1000 feet per minute or more shall be measured with inclined manometers (draft gauge) or magnehelic gauges; ducts having velocities of less than 1000 per feet per minute shall be measured with micromanometers, hook gauges, or similar low pressure instruments. Openings in ducts for pitot tube insertion shall be sealed with snap-in plugs and covered with duct tape after air balance is complete. Diffuser, grille and register air quantities shall be determined by direct reading velocity meters in accordance with the manufacturer's recommendations.

m. Obtain design air quantities in main duct by adjusting fan. Branch duct air quantities shall be adjusted by volume dampers. Dampers shall be permanently marked after air balance is complete to enable them to be restored to their correct position if disturbed at any time.

n. Opposed blade dampers at diffusers and register shall be used to balance air quantities providing final adjustments do not produce objectionable drafts or sound levels. Air quantity adjustments by outlet, deflectors, grids or air scoops will not be permitted.

o. As part of this Contract, the Balancing Contractor shall change the pulleys, belts, and fixed sheaves to provide for permanent sheaves, pulleys and belts, based on the final balancing, in order to ensure proper air delivery of the various systems. The Balancing Contractor shall also make all necessary adjustments to vane axial fan blade pitch angle to achieve required airflow.

p. In cooperation with the ATC Contractor, determine the proper setpoint for all automatically operated damper, air valves, static pressure sensors, inlet vane actuators, or other variable or controllable devices requiring coordination between Balancing Contractor and ATC Contractor. The Balancing Contractor shall determine the lowest system static setpoint possible that will deliver the proper air quantities to all outlets at the maximum cooling condition, and will adjust the fan system to operate at it most economical setting to achieve this static setpoint. Final static pressure setpoints are to be recorded in the test and balance report and listed for each unit.

q. Any dampers, safing of baffles required for final balancing, as determined by the Balancing Contractor and the Architect, will be provided by the (HVAC Contractor) (Sheet Metal Contractor) to ensure proper performance, at no extra cost to the .

3.05 INSTALLED ELEMENT TEST PROCEDURES

A. Element identification (location or number designation).

B. Required temperature drop corrected for actual entering air and water conditions.

C. Element adjusted until the required drop is obtained.

3.06 SYSTEM PERFORMANCE VERIFICATION

A. At the time of final inspection, the test and balance agency shall recheck, in the presence of the Representative, specific and random selections of data, air quantities, and air motion recorded in the Certified Report.

B. Points and areas for recheck shall be selected by the Owner's Representative.

C. Measurement and test procedures shall be the same as approved for work forming basis of Certified Report.

D. Selections for recheck, specific plus random, will not normally exceed 25% of the total number tabulated in the report, except that special air systems may require a complete recheck for safety reasons.

E. If random test elicit a measure flow deviation of 10% or more from that recorded in the Certified Report listing, by 10% or more of the selected recheck stations, the report rejected, all systems shall be readjusted and tested, new data recorded, new Certified Report submitted, and new inspection tests made, all at not additional cost to .

F. Following system verification of the Certified Report by the 's Representative, the settings of all valves, splitters, dampers, and other adjustment devices shall be permanently marked by the testing and balancing agency so that adjustment can be restored if disturbed at any time. Devices shall not be marked until after system verification.

3.07 RECORD AND REPORT DATA

A. The test and balance report shall be complete with logs, data and records as required herein. All logs, data and records shall be typed on white bond paper and bound. The report shall be certified accurate and complete by the testing and balancing agency's certified balancing engineer.

B. Six (6) copies of the test and balance report are required and shall be submitted to the or the representative.

C. The report shall contain the following general data in format selected by the testing and balancing agency.
1. Project number.
2. Contract number.
3. Project title.
4. Project location.
5. Project architect.
6. Project mechanical engineer.
7. Test and balance agency.
8. Balancing Engineer.
9. General Contractor.
10. Mechanical Contractor.
11. Date tests were performed.
12. Certification

D. The test and balance reports shall be recorded on report forms conforming to the recommended forms in AABC National Standards. At a minimum, the report shall include:
1. Preface: A general discussion of the system, any abnormalities and problems encounters.

2. Instrumentation List: The list of instruments including type, model, manufacturer, serial number, and calibration dates.
3. System Identification: In each report the supply, return and exhaust openings and traverse point shall be numbered and/or lettered to correspond to the numbers and letters used on the report data sheets.

END OF SECTION

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Excavation and/or embankment from existing ground to subgrade, including soil sterilant, for roadways, driveways, parking areas, building pads, walks, paths, or trails and any other site improvements called for on the Plans.

1.2 SECTION EXCLUDES

A. Earthwork related to underground utility installation shall be performed in accordance with Sections 31 21 00, Utility Trenching and Backfill.

1.3 RELATED DOCUMENTS

A. ASTM
1. D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
2. D1586, Method for Penetration Tests and Split-Barrel Sampling of Soils
3. D2487, Classification of Soils for Engineering Purposes
4. D3740, Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
5. D4318. Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils
6. E329, Specification for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
7. E548, Guide for General Criteria Used for Evaluating Laboratory Competence

B. California Building Code, California Code of Regulations, Title 24, Part 2, Chapter 18, Soils and Foundations, and Chapter 33, Safeguards During Construction

C. Caltrans Standard Specifications, 2023
1. Section 17, General
2. Section 19, Earthwork

D. CAL/OSHA, Title 8.

1.4 DEFINITIONS

A. Borrow: Approved soil material imported from off-site for use as Structural Fill or Backfill.

B. Excavation: Removal of material encountered above subgrade elevations.

1. Authorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions as shown on plans or authorized by the field Geotechnical Engineer.
2. Unauthorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions without authorization by the field Geotechnical Engineer. Unauthorized excavation shall be without additional compensation.

C. Geotechnical Testing Agency: An independent testing agency qualified according to ASTM E329 to conduct soil materials and rock definition testing, as documented according to ASTM D3740 and ASTM E548.

D. Structural Backfill: Soil materials approved by the field Geotechnical Engineer and used to fill excavations resulting from removal of existing below grade facilities, including trees.

E. Structural Fill: Soil materials approved by the field Geotechnical Engineer and used to raise existing grades.

F. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material ¾ cubic yards or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D1586, exceeds a standard penetration resistance of 100 blows/2 inches.

G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below grade.

H. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base or topsoil materials.

I. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of weeds, roots, and other deleterious materials.

J. Unsuitable Material: Any soil material that is not suitable for a specific use on the Project. The field Geotechnical Engineer will determine if a soil material is unsuitable.

K. Relative Compaction: In-place dry density of soil expressed as percentage of maximum dry density of same materials, as determined by laboratory test procedure ASTM D1557.

L. Utilities: onsite underground pipes, conduits, ducts and cables.

1.5 SUBMITTALS

A. Follow submittal procedure outlined in Section 01 33 00, Submittal Procedures.

B. Samples:
1. If required by the field Geotechnical Engineer, provide 20 pound samples, sealed in airtight containers, tagged with source locations and suppliers of each proposed soil material from on-site or borrow sources, 72 hours prior to use. Do not import materials to the Project without written approval of the field Geotechnical Engineer.
2. Provide materials from same source throughout work. Change of source requires approval of the field Geotechnical Engineer.

C. Classification according to ASTM D2487 of each onsite or borrow soil material proposed for fill and backfill.
1. Laboratory compaction curve in conformance with ASTM D1557 for each onsite or borrow soil material proposed for fill and backfill.

1.6 QUALITY ASSURANCE

A. Conform all work and materials to the recommendations or requirements of the Geotechnical Report and meet the approval of the field Geotechnical Engineer.

B. Conform all work in accordance with Caltrans Standard Specification Section 17, General and Section 19, Earthwork.

C. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D1557.

D. Perform excavation, filling, compaction and related earthwork under the observation of the field Geotechnical Engineer. Materials placed without approval of the field Geotechnical Engineer will be presumed to be defective and, at the discretion of the field Geotechnical Engineer, shall be removed and replaced at no cost to the City of Berkeley. Notify the field Geotechnical Engineer at least 48 hours prior to commencement of earthwork and at least 48 hours prior to testing.

E. The field Geotechnical Engineer will perform observations and tests required to enable him to form an opinion of the acceptability of the Project earthwork. Correct earthwork that, in the opinion of the field Geotechnical Engineer, does not meet the requirements of these Technical Specifications and the Geotechnical Report.

F. Upon completion of the construction work, certify that all compacted fills and foundations are in place at the correct locations, and have been constructed in accordance with sound construction practice. In addition, certify that the materials used are of the types, quality and quantity required by these

Technical Specifications and the Geotechnical Report. The Contractor shall be responsible for the stability of all fills and backfills constructed by his forces and shall replace portions that in the opinion of the field Geotechnical Engineer have been displaced or are otherwise unsatisfactory due to the Contractor's operations.

G. Finish subgrade tolerance at completion of grading:
1. Building and paved areas: ±0.05 feet
2. Other areas: ±0.10 feet

1.7 PROJECT CONDITIONS

A. Promptly notify the Owner's Representative of surface or subsurface conditions differing from those disclosed in the Geotechnical Report. First notify the Owner's Representative verbally to permit verification and extent of condition and then in writing. No claim for conditions differing from those anticipated in the Contract Documents and disclosed in the Geotechnical Report will be allowed unless the Contractor has notified the Owner's Representative in writing of differing conditions prior to the Contractor starting work on affected items.

B. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.

C. Temporarily stock-pile fill material in an orderly and safe manner and in a location approved by the Owner's Representative.

D. Environmental Requirements: When unfavorable weather conditions necessitate interrupting earthwork operation, areas shall be prepared by compaction of surface and grading to avoid collection of water. Provide adequate temporary drainage to prevent erosion. After interruption, compaction specified in last layer shall be re-established before resuming work.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: On-site soils having an organic content of less than three percent by weight can be reused as fill as approved by the field Geotechnical Engineer. Fill material should be processed to remove concentration of organic material, debris and particles greater than 8 inches in maximum dimension. If undocumented on-site fill soils are encountered in the new building pads and loose or debris-laden soils are encountered in other areas, these soils should be completely removed and replaced by engineered compacted fill.

B. Imported soil should meet the general requirements listed above and have a Plasticity Index of less than 18 and at least 20 percent passing the No. 200 sieve. Import fill materials should be sampled and tested by the field Geotechnical Engineer at least 72 hours prior to delivery to the site.

2.2 SOIL STERILANT

A. Commercial chemical for weed control, registered by EPA. Provide granular, liquid or wet-able powder form.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform work in accordance with Caltrans Standard Specification Section 19, Earthwork, as modified by the Contract Documents.

B. Placement and compaction of material by flooding, ponding, or jetting will not be permitted.

C. The use of explosives will not be permitted.

D. Grading and earthwork operations shall be observed and tested by a representative of the field Geotechnical Engineer for conformance with the project plans/specifications and the geotechnical recommendations. This work includes site preparation, selection of satisfactory materials, and placement and compaction of the subgrades and fills. Sufficient notification prior to commencement of earthwork is essential to make certain that the work will be properly observed.

3.2 CONTROL OF WATER AND DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding the site and surrounding area. Provide dewatering equipment necessary to drain and keep excavations and site free from water.

B. Dewater during backfilling operation so that groundwater is maintained a least 1 foot below level of compaction effort.

C. Obtain the field Geotechnical Engineer’s approval for proposed control of water and dewatering methods.

D. Protect subgrades from softening, undermining, washout and damage by rain or water accumulation.

E. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations.

F. Maintain dewatering system in place until dewatering is no longer required.

3.3 WET WEATHER CONDITIONS

A. Do not prepare subgrade, place or compact soil materials if subgrade or materials are above optimum moisture content.

B. If the field Geotechnical Engineer allows work to continue during wet weather conditions, conform to supplemental recommendations provided by the field Geotechnical Engineer.

3.4 BRACING AND SHORING

A. Conform to California and Federal OSHA requirements.

B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the facility being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

C. Be solely responsible for all bracing and shoring and, if requested by the Owner's Representative, submit details and calculations to the Contractor. The Contractor may forward the submittal to the field Geotechnical Engineer, the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations related to the proposed facility shall precede a response to the submittal by the Owner's Representative.

D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the position or operation of the facility being constructed or adjacent utilities and facilities.

3.5 EXCAVATION

A. Excavate earth and rock to lines and grades shown on plans and to the neat dimensions indicated on the plans, required herein or as required to satisfactorily compact backfill.

B. Remove and dispose of large rocks, pieces of concrete and other obstructions encountered during excavation.

C. Excavation through buried concrete and other unknown obstructions will require specialized techniques for demolition and removal.

D. Where forming is required, excavate only as much material as necessary to permit placing and removing forms.

E. Provide supports, shoring and sheet piles required to support the sides of excavations or for protection of adjacent existing improvements.

F. The Contractor should anticipate encountering excessively over-optimum (wet) soil moisture condition during winter or spring grading, or during or following periods of rain. In addition, wet soil conditions may be found near

the water table. Wet soil can make proper compaction difficult or impossible. Wet soil conditions can be mitigated by:

1. Frequent spreading and mixing during warm dry weather.
2. Mixing with drier materials.
3. Mixing with a lime, lime-flyash, or cement product; or
4. Stabilizing with aggregate, geotextile stabilization fabric, or both.

Options 3 and 4 should be evaluated and approved by the field Geotechnical Engineer prior to implementation.

G. Uniformly grade the Project to the elevations shown on plans.

H. Finish ditches, gutters and swales to the sections, lines and grades indicated and to permit proper surface drainage.

I. Round tops and bottoms of slopes as indicated or to blend with existing contours.

J. Following excavation to the required grades, subgrades in exterior flatwork areas should be scarified to a depth of 6 inches and compacted to the specifications listed under Section 3.9.

3.6 SUBGRADE PREPARATION

A. Subgrade Preparation: All subgrade soils should be compacted and moisture conditioned per the requirements listed in the Geotechnical Report.

B. Over-excavate any remaining soft (pumping) areas down to firm soil and backfill the area.

C. Subgrade shall be maintained in a moist, but not wet, condition by periodically sprinkling water prior to the placement of additional fill or installation of roads. Subgrade that has been permitted to dry out and loosen or develop desiccation cracking should be scarified, moisture conditioned, and re-compacted as recommended above.

D. Install underground utilities and service connections prior to final preparation of subgrade and placement of base materials for final surface facilities. Extend services so that final surface facilities are not disturbed when service connections are made.

E. Prepare subgrades under the structural section of paved areas, curbs, gutters, walks, structures, other surface facilities and areas to receive structural fill.

F. Protect utilities from damage during compaction of subgrades and until placement of final pavements or other surface facilities.

G. Obtain the field Geotechnical Engineer’s approval of subgrades prior to placing pavement structural section.

3.7 KEYWAYS AND BENCHES

A. Provide keyways as indicated for fill slopes steeper than 6 horizontal to 1 vertical. Extend keyway 5 feet minimum into competent, undisturbed soil or 3 feet minimum into competent, undisturbed rock as directed by the field Geotechnical Engineer.

B. Bench subgrade as indicated above toe of fill.

C. Place subsurface drains at benches every 20 vertical feet or as directed by the field Geotechnical Engineer.

3.8 FINISH GRADING

A. Blade finish lots to lines and grades indicated.

3.9 FILL PLACEMENT AND COMPACTION

A. Place fill in uniformly moisture conditioned and compacted lifts. The lift thickness should not exceed 12 inches or the depth of penetration of the compaction equipment used, whichever is less. The required moisture content shall be not less than 2 percentage points above optimum moisture content and the required relative compaction shall be not less than 90 percent.

B. In order to achieve satisfactory compaction in the subgrade and fill soils, it may be necessary to adjust the soil moisture content at the time of soil compaction per geotechnical recommendations. This may require that water be added and thoroughly mixed into any soils which are too dry or that scarification and aeration be performed in any soils which are too wet.

C. Obtain the field Geotechnical Engineer’s approval of surface to receive structural fill prior to placement of structural fill material.

D. Place structural fill on prepared subgrade.

E. Do not drop fill on structures. Do not backfill around, against or upon concrete or masonry structures until structure has attained sufficient strength to withstand loads imposed and the horizontal structural system had been installed.

F. Do not compact by ponding, flooding or jetting.

G. Perform compaction using rollers, pneumatic or vibratory compactors or other equipment and mechanical methods approved by the field Geotechnical Engineer.

3.10 SOIL STERILIZATION

A. Apply soil sterilant to areas indicated, such as beneath asphalt concrete pavement, brick pavement, concrete pavement and at grade concrete slabs,

including sidewalks, curbs and gutters. Also where indicated apply soil sterilant below expansion and control joints and at areas where pipes, ducts or other features penetrate slabs.

B. Apply soil sterilant uniformly and at the rates recommended by the manufacturer.

C. Apply soil sterilant to prepared subgrade, or after installation of aggregate base as recommended by the manufacturer.

3.11 DISPOSAL

A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

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SECTION 31 21 00

UTILITY TRENCHING AND BACKFILL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Excavation, bedding, and backfill for underground storm drain, sanitary sewer, and water piping, underground HVAC piping, electrical conduit, telephone conduit, gas piping, cable TV conduit, etc., and associated structures.

B. Provide labor, material, equipment, and services necessary to complete the backfilling and compacting as necessary for this project. Section includes, but is not limited to:

1. Select Backfill Material
2. Aggregate Base
3. Detectable Tape
4. Trench Excavation
5. Pipe Bedding
6. Trench Backfill
7. Trench Surfacing

1.2 RELATED SECTIONS

A. Section 31 20 00 – Earth Moving

B. Section 33 41 00 – Storm Utility Drainage Piping

1.3 RELATED DOCUMENTS

A. ASTM
1. D1557, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
2. D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewer and Other Gravity-Flow Applications.

B. California Administrative Code, Title 24, Part 2 - Basic Building Regulations, Chapter 24, Excavations, Foundations, and Retaining Walls.

C. Caltrans Standard Specifications, 2023.
1. Section 19, Earthwork
2. Section 26, Aggregate Bases

D. CAL/OSHA, Title 8

1.4 DEFINITIONS

A. AC: Asphalt Concrete

B. ASTM: American Society for Testing and Materials

C. Base: The layer placed between the subgrade and surface pavement in a paving system.

D. Bedding: Material from bottom of trench to bottom of pipe

E. CDF: Controlled Density Fill

F. DIP: Ductile Iron Pipe

G. Engineered Fill:
   1. Soil or soil-rock material approved by the Owner and transported to the site by the Contractor in order to raise grades or to backfill excavations.
   2. Contractor shall provide sufficient tests, and a written statement that all materials brought onto the project site comply with specification requirements.

H. Excavation: Consists of the removal of material encountered to subgrade elevations

I. Initial Backfill: Material from bottom of pipe to 12 inches above top of pipe

J. PCC: Portland Cement Concrete

K. RCP: Reinforced Concrete Pipe

L. Relative Compaction: In-place dry density of soil expressed as percentage of maximum dry density of same materials, as determined by laboratory test procedure ASTM D1557.

M. Springline of Pipe: Imaginary line on surface of pipe at a vertical distance of ½ the outside diameter measured from the top or bottom of the pipe.

N. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below base.

O. Subsequent Backfill: Material from 12 inches above top of pipe to subgrade of surface material or subgrade of surface facility or to finish grade.

P. Trench Excavation: Removal of material encountered above subgrade elevations and within horizontal trench dimensions.
   1. Authorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions as shown on plans or authorized by the field Geotechnical Engineer.
   2. Unauthorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions without authorization by the field Geotechnical Engineer. Unauthorized excavation shall be without additional compensation.

Q. Utility Structures:

1. Storm drainage manholes, catch basins, drop inlets, curb inlets, vaults, etc.
2. Sanitary sewer manholes, vaults, etc.
3. Water vaults, etc.

1.5 SUBMITTALS

A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.

B. Test Reports: Submit the following report for import material directly to the Owner from the Contractor's testing services:
   1. Compaction test reports for aggregate base.

C. Samples:
   1. Do not import materials to Project without written approval of the field Geotechnical Engineer and the Owner.
   2. Provide materials from same source throughout work. Change of source requires approval of the field Geotechnical Engineer and the Owner.

1.6 QUALITY ASSURANCE

A. Conform all work and materials to the recommendations or requirements of the Geotechnical Report and meet the approval of the field Geotechnical Engineer.

B. Conform all work to the appropriate portion(s) of the Caltrans Standard Specifications, Section 19, Earthwork.

C. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.

D. The field Geotechnical Engineer will perform observations and tests required to enable them to form an opinion of the acceptability of the trench backfill. Correct the trench backfill that, in the opinion of the field Geotechnical Engineer, does not meet the requirements of these Technical Specifications and the Geotechnical Report.

E. Soil Testing:
   1. Contractor to engage a geotechnical testing agency, to include compaction testing and for quality control testing during fill operations.
   2. Test results will be submitted to the Owner.

1.7 PROJECT CONDITIONS

A. Promptly notify the Owner of surface or subsurface conditions differing from those disclosed in the Geotechnical Report. First notify the Owner verbally to permit verification and extent of condition and then in writing. No claim for conditions differing from those anticipated in the Contract Documents and disclosed in the Geotechnical Report will be allowed unless Contractor has notified the Owner in writing of differing conditions prior to contractor starting work on affected items.

B. Barricade open excavations and post with warning lights.

1. Operate warning lights and barricades as required.
2. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations, from damages caused by settlement, lateral movement, undermining, washout, and other hazards.
3. Protect open, trenches, and utility structure excavations with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.

C. Stockpile on-site and imported backfill material temporarily in an orderly and safe manner.

D. Environmental Requirements:
1. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the City of Berkeley.
2. Protect existing streams, ditches and storm drain inlets during work on this project.

E. Protection of Subgrade: Do not allow equipment to pump or rut subgrade, stripped areas, footing excavations, or other areas prepared for project.

F. Transport all excess soils materials by legally approved methods to disposal areas.
1. Coordinate with the Engineer.
2. Any additional fill requirements shall be the responsibility of the Contractor.

1.8 EXISTING UTILITIES

A. Locate existing underground utilities in the areas of work. For utilities that are to remain in place, provide adequate means of protection during excavation operations.
1. Locating of existing underground utilities shall include but not be limited to pot-holing prior to the start of construction.

B. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult Owner and/or utility agency immediately for directions.
1. Cooperate with the Owner and public and private utility companies in keeping their respective services and facilities in operation.
2. Repair damaged utilities to the satisfaction of the agency with jurisdiction.

C. Do not interrupt existing utilities serving facilities occupied and used by the Owner or others, except when permitted in writing by the Owner and then only after acceptable temporary utility services have been provided.

PART 2 - PRODUCTS

2.1 GENERAL

A. Utility trenches may be backfilled with approved native soil above the utility bedding and shading materials compacted to the recommended compaction presented in the Geotechnical Report.

B. Utility bedding and shading compaction requirements should be in conformance with the recommendations of pipe manufacturers.

C. Import materials will be subject to approval of the field Geotechnical Engineer.

D. Pea gravel, rod mill, or other similar self-compacting material shall not be used as trench backfill.

E. For approval of imported fill material, notify the Owner at least 3 days in advance of intention to import material.

2.2 PIPE BEDDING AND INITIAL BACKFILL

A. ASTM D2321, Class IA, IB or II.
   1. Clean and free of clay, silt or organic matter.

B. Permeable Material: In accordance with Section 68-2.02F of Caltrans Standard Specifications, Class 1, Type A or Class 2.

C. Class 2 Aggregate Base: In accordance with Section 26 of Caltrans Standard Specifications, ¾ inch maximum.

D. Sand: In accordance with Section 19-3.02F of Caltrans Standard Specifications.

2.3 SELECT BACKFILL

A. Select backfill material shall be gravel, free of clay or organic matter and shall conform to the requirement listed in the Geotechnical Report.

2.4 WARNING TAPE

A. Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.
   1. Warning Tape Color Codes
      a. Red: Electric
      b. Yellow: Gas, Oil; Dangerous Materials
      c. Orange: Telephone and Other Communications
      d. Blue: Water Systems
      e. Green: Sewer Systems
      f. White: Steam Systems
      g. Gray: Compressed Air
   2. Warning Tape for Metallic Piping: Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall

have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

3. Detectable Warning Tape for Non-Metallic Piping: Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.5 DETECTION WIRE FOR NON-METALLIC PIPING

A. Detection wire shall be insulated single strand, solid copper with a minimum of 12 AWG.

2.6 SUBSEQUENT BACKFILL

A. Conform to on-site or imported structural backfill in Section 31 20 00, Earth Moving.

2.7 CONTROLLED DENSITY FILL (CDF) (IN TRENCHES)

A. Provide non-structural CDF, from bottom of trench to finish subgrade of subbase or base material, that can be excavated by hand and produce unconfined compressive 28-day strengths from 50-psi to a maximum of 150-psi. Provide aggregate no larger than 3/8 inch top size. The 3/8 inch aggregate shall not comprise more than 30% of the total aggregate content.

B. Cement: Conform to the standards as set forth in ASTM C150, Type II Cement.

C. Fly Ash: Conform to the standards as set forth in ASTM C618, for Class F pozzolan. Do not inhibit the entrainment of air with the fly ash.

D. Air Entraining Agent: Conform to the standards as set forth in ASTM C260.

E. Aggregates need not meet the standards as set forth in ASTM C33. Any aggregate, producing performances characteristics described herein will be accepted for consideration. The amount of material passing a #200 sieve shall not exceed 12% and no plastic fines shall be present.

F. Provide CDF that is a mixture of cement, Class F pozzolan, aggregate, air entraining agent and water. CDF shall be batched by a ready mixed concrete plant and delivered to the job site by means of transit mixing trucks.

G. The Contractor shall determine the actual mix proportions of the controlled density fill to meet job site conditions, minimum and maximum strengths, and unit weight. Entrained air content shall be a minimum of 4.0%. The actual entrained air content shall be established for each job with the materials and aggregates to be used to meet the placing and unit weight requirements. Entrained air content may be as high as 20% for fluidity requirements.

H. Mix design shall meet the field Geotechnical Engineer's approval.

2.8 CONCRETE STRUCTURE BEDDING AND BACKFILL

A. Precast Structures: Same materials to the same heights as specified for pipe bedding and backfill, or other material approved by the field Geotechnical Engineer.

B. Poured-in-Place Structures:
   1. Bedding: Bedding shall meet the approval of the field Geotechnical Engineer. In general, bedding is not required, pour bases against undisturbed native earth in cut areas and against engineered fill compacted to 90% relative compaction in embankment areas.
   2. Side Backfill: On-site or imported structural fill meeting the requirements given in Section 31 20 00, Earth Moving.

PART 3 - EXECUTION

3.1 GENERAL

A. Comply with the recommendations of the field Geotechnical Engineer.

B. Protect existing trees to remain. No grading is permitted under the drip line of protected trees.

C. Excavations for appurtenant structures, such as, but not limited to, manholes, transition structures, junction structure, vaults, valve boxes, catch basins, thrust blocks, and boring pits, shall be deemed to be in the category of trench excavation.

D. Unless otherwise indicated in the Plans, all excavation for pipelines shall be open cut.

E. Prior to commencement of work, become thoroughly familiar with site conditions.

F. In the event discrepancies are found, immediately notify the Owner in writing, indicating the nature and extent of differing conditions.

G. Backfill excavations as promptly as work permits.

H. Do not place engineered fill or backfill until rubbish and deleterious materials have been removed and areas have been approved by the Owner.

I. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.

J. In excavations, use satisfactory excavated or borrow material.

K. Under grassed areas, use satisfactory excavated or borrow material.

3.2 SITE PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, which are to remain, from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the Owner.

3.3 EXISTING UTILITIES

A. Identity the location of existing utilities.
   1. Prior to trenching, the Contractor shall excavate at locations specifically indicated on the Plans, if any, and where new lines cross other utilities of uncertain depth and determine the elevation of the utility in question to ensure that the new line will clear the potential obstruction.
   2. The Contractor shall contact Underground Service Alert (USA) at 1-800-227-2600 for assistance in locating existing utilities.
   3. If, after the excavation, a crossing utility does present an obstruction, then the line and grade of the new line will be adjusted as directed by the Owner to clear the utility.

B. Protect all existing utilities to remain in operation.

C. Movement of construction machinery and equipment over existing pipes and utilities during construction shall be at Contractor's risk.

D. Excavation made with power-driven equipment is not permitted within 2 feet of any known utility or subsurface structure.
   1. Use hand or light equipment for excavating immediately adjacent to known utilities or for excavations exposing a utility or buried structure.
   2. Start hand or light equipment excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured.
   3. Support uncovered lines or other existing work affected by excavation until approval for backfill is obtained.
   4. Report damage of utility line or subsurface structures immediately to the Owner.

E. Backfill trenches resulting from utility removal in lifts of 8 inches maximum.

3.4 TRENCH EXCAVATION

A. General
   1. Excavation shall include removal of all water and materials that interfere with construction. The Contractor shall remove any water which may be encountered in the trench by pumping or other methods during the pipe

laying, bedding and backfill operations. Material shall be sufficiently dry to permit approved jointing.
2. Excavation shall include the construction and maintenance of bridges required for vehicular and pedestrian traffic, support for adjoining utilities.
3. The Contractor shall be responsible to safely direct vehicular and pedestrian traffic through or around his/her work area at all times.
4. The Contractor shall relocate, reconstruct, replace or repair, at his/her own expense, all improvements which are in the line of construction or which may be damaged, removed, disrupted or otherwise disturbed by the Contractor.

B. Existing Paving and Concrete:
1. Existing pavement over trench shall be sawcut, removed, and hauled away from the job. Existing pavement shall be neatly sawcut along the limits of excavations.
2. Existing concrete over the trench shall be sawcut to a full depth in straight lines, at a minimum distance of 12 inches beyond the edge of the trench, either parallel to the curb or a right angles to the alignment of the sidewalk.
3. Boards or other suitable material shall be placed under equipment outrigging to prevent damage to paved surfaces.

C. Trench Width:
1. The maximum allowable trench widths at the top of the all pipe materials outside diameter of barrel pipe plus 18 inches. shall be as follows:
    a. The maximum trench width shall be inclusive of all shoring.
    b. If the maximum trench width is exceeded, the State's representative may direct the Contractor to encase or cradle the pipe in concrete at no additional charge.
2. For pipes 3 inch diameter and larger, the free working space on each side of the pipe barrel shall not be less than 6 inches.

D. Excavation Width at Springline of Pipe:
1. Up to a nominal pipe diameter of 24 inches: Minimum of twice the outside pipe diameter, or as otherwise allowed or required by the field Geotechnical Engineer.
2. Nominal pipe diameter of 30 inches through 36 inches: Minimum of the outside pipe diameter plus 2 feet, or as otherwise allowed or required by the field Geotechnical Engineer.
3. Nominal pipe diameter of 42 inches through 60 inches: Minimum of the outside pipe diameter plus 3 feet, or as otherwise allowed or required by the field Geotechnical Engineer.

E. Open Trench:

1. The maximum length of open trench shall be 300 feet or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. No trench shall be left open at the end of the day.
2. Provisions for trench crossings and free access shall be made at all street crossings, driveways, water gate valves, and fire hydrants.
3. Excavate by hand or machine. For gravity systems begin excavation at the outlet end and proceed upstream. Excavate sides of the trench parallel and equal distant from the centerline of the pipe. Hand trim excavation. Remove loose matter.
4. Excavation Depth for Bedding: Minimum of 6 inches below bottom of pipe or as otherwise allowed or required by the field Geotechnical Engineer, except that bedding is not required for nominal pipe diameters of 2 inches or less.
5. Over-Excavations: Backfill trenches that have been excavated below bedding design subgrade, with approved bedding material.
6. Where forming is required, excavate only as much material as necessary to permit placing and removal of forms.
7. Grade bottom of trench to provide uniform thickness of bedding material and to provide uniform bearing and support for pipe along entire length. Remove stones to avoid point bearing.

F. Excavated Material:
   1. All excavated material not required for backfill shall be immediately removed and properly disposed of in a legal manner by the Contractor.
   2. Material excavated in streets and roadways shall be laid alongside the trench no closer than 2 feet from the trench edge and kept trimmed to minimize inconvenience to public traffic.
   3. Provisions shall be made whereby all storm and wastewater can flow uninterrupted in gutters or drainage channels.

G. Be solely responsible for dewatering trenches and excavations and subsequent control of ground and surface water. Provide and maintain such pumps or other equipment as may be necessary to control ground water and seepage to the satisfaction of the field Geotechnical Engineer and the Owner until backfilling is completed.

H. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.

I. Obtain the field Geotechnical Engineer’s approval for proposed control of water and dewatering methods.

J. Reroute surface water runoff away from open trenches and excavations. Do not allow water to accumulate in trenches and excavations.

K. Maintain dewatering system in place until dewatering is no longer required.

3.5 BRACING AND SHORING

A. Conform to California and Federal OSHA requirements.

B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the pipes and appurtenances being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

C. Be solely responsible for all bracing and shoring and, if requested by the Owner, submit details and calculations to the Owner. The Owner may forward the submittal to the field Geotechnical Engineer, the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations in trench section or around structures shall precede a response to the submittal by the Owner.

D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the line, grade, or backfill compaction or operation of the utility being installed or adjacent utilities and facilities.

3.6 PIPE BEDDING

A. Obtain approval of bedding material from the field Geotechnical Engineer.

B. Carefully place and compact bedding material to the elevation of the bottom of the pipe in layers not exceeding 8 inches in loose thickness. Compact bedding material at optimum water content to 92% relative compaction in pavement areas and 90% relative compaction in all other areas, unless specified otherwise on the Plans or by the field Geotechnical Engineer. Compact by pneumatic tampers or other mechanical means approved by the field Geotechnical Engineer. Jetting or ponding of bedding material will not be permitted.

C. Stabilization of Trench Bottom: When the trench bottom is unstable due to wet or spongy foundation, trench bottom shall be stabilized with gravel or crushed rock. The State’s inspector will determine the suitability of the trench bottom and the amount of gravel or crushed rock needed to stabilize a soft foundation. Soft material shall be removed and replaced with gravel or crushed rock as necessary.

D. Placement of Bedding Material: The trench bottom shall be cleaned to remove all loose native material prior to placing select backfill material. Sufficient select backfill material shall be placed in trench and tamped to bring trench bottom up to grade of the bottom of pipe. The relative compaction of tamped material shall be not less than 90 percent. It is the intention of these requirements to provide uniform bearing under the full length of pipe to a minimum width of 60 percent of the external diameter.

3.7 BACKFILLING

A. Initial Backfill:

1. Obtain approval of backfill material from field Geotechnical Engineer.
2. Bring initial backfill up simultaneously on both sides of the pipe, so as to prevent any displacement of the pipe from its true alignment. Carefully place and compact initial backfill material to an elevation of 12 inches above the top of the pipe in layers not exceeding 8 inches in loose thickness. Compact bedding material at optimum water content to 92% relative compaction in pavement areas and 90% relative compaction in all other areas, unless specified otherwise on the Plans or by the field Geotechnical Engineer. Compact by pneumatic tampers or other mechanical means approved by the field Geotechnical Engineer. Jetting or ponding of initial backfill material will not be permitted.

B. Pipe Detection: In trenches containing pressurized plastic pipes, tracer wire shall be placed directly above the pipe and shall be connected to all valves, existing exposed tracer wires, and other appurtenances as appropriate.

C. Subsequent Backfill:
   1. Above the level of initial backfill, the trench shall be backfilled with non-expansive native material from trench excavation or with imported select backfill material (Contractor's option). Subsequent backfill shall be free of vegetable matter, stones or lumps exceeding 3 inches in greatest dimension, and other unsatisfactory material.
   2. Bring subsequent backfill to subgrade or finish grade as indicated. Carefully place and compact subsequent backfill material to the proper elevation in layers not exceeding 8 inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction, except that the upper 36 inches in areas subject to vehicular traffic shall be compacted to at least 95% relative compaction, unless specified otherwise on the Plans or by the field Geotechnical Engineer. Compact by pneumatic tampers or other mechanical means approved by the field Geotechnical Engineer. Jetting or ponding of subsequent backfill material will not be permitted.
   3. Utility trenches should be completely sealed with concrete, clayey soil, sand-cement slurry, or controlled density fill where the utility enters the building under the perimeter foundation.

D. Do not use compaction equipment or methods that produce horizontal or vertical earth pressures that may cause excessive pipe displacement or damage the pipe. Jetting of trench backfill is not permitted.

E. Utility backfill shall be inspected and tested by the field Geotechnical Engineer during placement. Cooperate with the field Geotechnical Engineer and provide working space for such tests in operations. Backfill not compacted in accordance with these specifications shall be re-compacted or removed as necessary and replaced to meet the specified requirements, to the satisfaction of the field Geotechnical Engineer and the Owner prior to proceeding with the Project.

F. Compaction testing shall be in accordance with California Test Method ASTM D1556 or D1557.

3.8 CLEANUP

A. Upon completion of utility earthwork all lines, manholes catch basins, inlets, water meter boxes and other structures shall be thoroughly cleaned of dirt, rubbish, debris and obstructions of any kind to the satisfaction of the Owner.

END OF SECTION

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SECTION 32 11 00

PAVEMENT BASE COURSE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Aggregate base

B. Cement treated base

C. Lime stabilization

1.2 RELATED SECTIONS

A. Section 31 20 00, Earth Moving

1.3 RELATED DOCUMENTS

A. ASTM:
   1. D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
   2. D3740, Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
   3. E329, Specification for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
   4. E548, Guide for General Criteria Used for Evaluating Laboratory Competence

B. Caltrans Standard Specifications, 2023
   1. Section 24, Stabilized Soils
   2. Section 26, Aggregate Bases
   3. Section 27, Cement Treated Bases

1.4 DEFINITIONS

A. Geotechnical Testing Agency: An independent testing agency qualified according to ASTM E329 to conduct soil materials and rock definition testing, as documented according to ASTM D3740 and ASTM E548.

B. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material ¾ cubic yards or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D1586, exceeds a standard penetration resistance of 100 blows/2 inches.

C. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below grade.

D. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below base or topsoil materials. Perform work in accordance with Section 31 20 00, Earth Moving.

1.5 SUBMITTALS

A. Follow submittal procedure outlined in Section 01 33 00, Submittal Procedures.

B. Submit material certificates signed by the material producer and the Contractor, certifying that that each material item complies with, or exceeds the specified requirements.

1.6 QUALITY ASSURANCE

A. Conform all work and materials meet the approval of the field Geotechnical Engineer.

B. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D1557.

C. Perform installation of base materials under the observation of the field Geotechnical Engineer. Materials placed without approval of the field Geotechnical Engineer will be presumed to be defective and, at the discretion of the field Geotechnical Engineer, shall be removed and replaced at no cost to the Owner. Notify the field Geotechnical Engineer at least 24 hours prior to commencement of base material installation and at least 48 hours prior to testing.

D. Do not mix or place cement treated base when the temperature is below is below 36 degrees F or when the ground is frozen.

E. Finish surface of material to be stabilized prior to lime treatment shall be in accordance with Caltrans Standard Specification Section 24, Stabilized Soils.

F. Finish surface of the stabilized material after lime treatment shall be in accordance with Caltrans Standard Specifications Section 24, Stabilized Soils.

G. Finish surface of cement treated base shall be in accordance with Caltrans Standard Specification Section 27, Cement Treated Bases.

H. Do not project the finish surface of aggregate base above the design subgrade.

I. Finish grade tolerance at completion of base installation: +0.05 feet

1.7 PROJECT CONDITIONS

A. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.

B. Temporarily stockpile material in an orderly and safe manner and in a location approved by the Owner.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE

A. Material: Class 2 in accordance with Caltrans Standard Specification Section 26, Aggregate Bases.

2.2 CEMENT TREATED BASE

A. Material: Class A or B maximum in accordance with Caltrans Standard Specification Section 27, Cement Treated Bases.

2.3 LIME STABILIZED SOILS

A. Material: In accordance with Caltrans Standard Specification Section 24-2, Lime Stabilized Soil.

PART 3 - EXECUTION

3.1 GENERAL

A. Placement and compaction of material by flooding, ponding, or jetting will not be permitted.

3.2 WET WEATHER CONDITIONS

A. Do not place or compact subgrade if above optimum moisture content.

B. If the field Geotechnical Engineer allows work to continue during wet weather conditions, conform to supplemental recommendations provided by the field Geotechnical Engineer.

3.3 AGGREGATE BASE

A. Watering, Spreading and Compacting: In accordance with Caltrans Standard Specification Section 26-1.03D, Spreading and 26-1.03E, Compacting.

B. Aggregate base should be compacted to at least 95 percent relative compaction. Moisture condition aggregate base to or slightly above the optimum moisture content prior to compaction.

3.4 CEMENT TREATED BASE

A. Proportioning and Mixing Plant-Mixed: In accordance with Caltrans Standard Specification Section 27-1.03D.

3.5 LIME STABILIZATION

A. Lime stabilization shall conform to Caltrans Standard Specification Section 24, Stabilized Soils, and the following:
   1. Add lime in the amount specified by the field Geotechnical Engineer.
   2. Lime treat subgrade soils from back of curb to back of curb to a depth specified by the field Geotechnical Engineer.
   3. Mix in two mixing periods, both with the tines lowered to the same depth. Both mixing periods shall be monitored and verified by the field Geotechnical Engineer. The second mixing shall occur at about 24 hours after the initial mixing.
   4. Compact and grade the lime mixed subgrade immediately after the second mixing.
   5. Compact the lime treated subgrade to 93 percent as determined by ASTM D1557.
   6. After application of the curing seal, do not allow traffic on the lime treated material for a period of 7 days in lieu of the 3 days specified in Caltrans Standard Specifications, Section 24.
   7. Proof-roll the stabilized subgrade after compacting to confirm that a non-yielding surface has been achieved. Yielding areas, if any, shall be mitigated. Mitigation could consist of over-excavation, utilization of stabilization fabric, or chemical treatment. Each case shall be addressed individually in the field by the field Geotechnical Engineer.

3.6 DISPOSAL

A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 32 13 13

CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Furnishing, placing, spreading, compacting and shaping portland cement concrete pavement with undoweled transverse weakened plane joints, for vehicular traffic.

B. Form construction and use in placing portland cement concrete pavement.

C. Joints for portland cement concrete pavement.

D. Finishing portland cement concrete pavement.

E. Curing and protecting portland cement concrete pavement.

1.2 RELATED SECTIONS

A. 31 20 00, Earth Moving

B. 32 11 00, Pavement Base Course

C. 32 13 18, Cement and Concrete for Exterior Improvements

1.3 RELATED DOCUMENTS

A. AASHTO Standard Specifications

1. T132: Standard Method of Test for Tensile Strength of Hydraulic Cement Mortars

B. ASTM Standards

1. D36: Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
2. C94: Standard Specification for Ready-Mixed Concrete
3. C603: Standard Test Method for Extrusion Rate and Application Life of Elastomeric Sealants
4. C639: Standard Test Method for Rheological (Flow) Properties of Elastomeric Sealants
5. C661: Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer
6. C679: ASTM C679-15 Standard Test Method for Tack-Free Time of Elastomeric Sealants
7. C719: Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)

8. C793: Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants
9. C881: Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
10. D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
11. D1640: Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings
12. D2628: Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
13. D2835: Standard Specification for Lubricant for Installation of Preformed Compression Seals in Concrete Pavements.
14. D6690: Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

C. Caltrans Standard Specifications, 2023

1. Section 10, General
2. Section 40, Concrete Pavement
3. Section 95, Epoxy

D. Caltrans Standard Plans:

1. Plan P1: Jointed Plan Concrete Pavement – New Construction
2. Plan P10: Concrete Pavement Dowel Bar Details

1.4 DEFINITIONS

A. AASHTO: American Association of State Highway and Transportation Officials

B. ASTM: American Society for Testing and Materials

C. Caltrans: State of California, Department of Transportation

1.5 QUALITY ASSURANCE

A. Testing Agency: Contractor will engage a qualified independent testing agency to perform field inspections and tests and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested work complies with or deviates from specified requirements.

B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

C. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C94 requirements for production facilities and equipment.

D. Installer Qualification: An experienced installer who has completed pavement work similar in material, design and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

1.6 SUBMITTALS

A. Follow submittal procedure outlined in Section 01 33 00, Submittal Procedures.

B. Design Mixes: For each concrete pavement mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results or other circumstances warrant adjustments.

C. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements.

1. Cementitious materials and aggregates
2. Admixtures
3. Curing compound
4. Applied finish material
5. Bonding agent of adhesive
6. Joint filler
7. Joint Sealant
8. Tie Bars
9. Epoxy
10. Backer Rods

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT CONCRETE

A. In accordance with Section 32 13 18, Cement and Concrete for Exterior Improvements.

2.2 BASE MATERIAL

A. In accordance with Section 32 11 00, Pavement Base Course.

2.3 TIE BARS

A. Deformed reinforcing steel bars conforming to the requirements of ASTM Designation A615, Grade 40 or 60

B. Epoxy-coat in accordance with Caltrans Standard Specification Section 52-2.02, Epoxy-Coated Reinforcement, except bars must comply with ASTM A706; ASTM A996; or ASTM A615, Grade 40 or 60.

C. Do not bend tie bars.

2.4 EPOXY

A. Bond tie bars to existing concrete with epoxy resin in accordance with Caltrans Standard Specification Section 95-1.02D, Epoxy Adhesive for Bonding Freshly Mixed Concrete to Hardened Concrete.

2.5 SILICONE JOINT SEALANT

A. Furnish low modulus silicone joint sealant in a one-part silicone formulation. Do not use acid cure sealants. Compound to be compatible with the surface to which it is applied and conform to the following requirements:

Specification	Test Method	Requirement
Tensile stress, 150% elongation, 7-day cure at 77°± 1°F and 45% to 55% Relative Humidity	ASTM D412 (Die C)	45 psi max.
Flow at 77° ± 1°F	ASTM C639[a]	Shall not flow from channel
Extrusion Rate at 77° ± 1°F	ASTM C603[b]	75-250 g per min.
Specific Gravity	ASTM D792 Method A	1.01 to 1.51
Durometer Hardness, at 0°F, Shore A, cured 7 days at 77° ± 1°F	ASTM C661	10 to 25
Ozone and Ultraviolet Resistance, after 5000 hours	ASTM C793	No chalking, cracking or bond loss
Tack free at 77° ± 1°F and 45% to 55% Relative Humidity	ASTM C679	Less than 75 minutes
Elongation, 7 day cure at 77° ± 1°F and 45% to 55% Relative Humidity	ASTM D412 (Die C)	500 percent min.
Set to Touch, at 77° ± 1°F and 45% to 55% Relative Humidity	ASTM D1640	Less than 75 minutes
Shelf Life, from date of shipment	—	6 months min.
Bond, to concrete mortar-concrete briquets, air cured 7 days at 77° ± 1°F	AASHTO T132[c]	50 psi min.
Movement Capability and Adhesion, 100% extension at 0°F after air cured 7 days at 77° ± 1°F, and followed by 7 days in water at 77° ± 1°F	ASTM C719[d]	No adhesive or cohesive failure after 5 cycles

Notes:

a. ASTM Designation: C639 Modified (15 percent slope channel A).
b. ASTM Designation: C603, through $^{1}/_{8}$ inches opening at 50 psi.
c. Mold briquets in conformance with the requirements in AASHTO Designation: T132, sawed in half and bonded with a $^{1}/_{16}$ inches maximum thickness of sealant and tested in conformance with the requirements in AASHTO Designation: T132. Briquets shall be dried to constant mass at 212 ± 10°F.
d. Movement Capability and Adhesion: Prepare 12 inch x 1 inch x 3 inch concrete blocks in conformance with the requirements in ASTM Designation: C719. A sawed face shall be used for bond surface. Seal 2 inch of block leaving ½ inches on each end of specimen unsealed. The depth of sealant shall be $^{3}/_{8}$ inches and the width ½ inches.

B. Formulate the silicon joint sealant to cure rapidly enough to prevent flow after application on grades of up to 15 percent.

C. Furnish to the Contractor a Certificate of Compliance. Accompany certificate with a certified test report of the results of the required tests performed on the sealant material within the previous 12 months prior to proposed use. Provide the certificate and accompanying test report for each lot of silicone joint sealant prior to use on the project.

2.6 ASPHALT RUBBER JOINT SEALANT

A. Conform to the requirements of ASTM Designation: D6690 as modified herein or to the following:

1. Provide a mixture of paving asphalt and ground rubber. Ground rubber to be vulcanized or a combination of vulcanized and de-vulcanized materials ground so that 100 percent will pass a No. 08 sieve and contain not less than 22 percent ground rubber, by mass. Modifiers may be used to facilitate blending.
2. The Ring and Ball softening point shall be 135°F minimum, when tested in conformance with the requirements in ASTM D36.
3. Provide asphalt rubber sealant material capable of being melted and applied to cracks and joints at temperatures below 400°F.

B. The penetration requirements of Section 4.2 of ASTM Designation: D6690 do not apply. The required penetration at 77˚F, 5 oz, 5s, shall not exceed 120.

C. The resilience requirements of Section 4.5 of ASTM Designation: D6690 do not apply. The required resilience, when tested at 77°F, shall have a minimum of 50 percent recovery.

D. Accompany each lot of asphalt rubber joint sealant shipped to the job site, whether as specified herein or conforming to the requirements of ASTM Designation D6690, as modified herein, by a Certificate of Compliance, storage and heating instructions and precautionary instructions for use.

E. Heat and place in conformance with the manufacturer's written instructions and the details shown on the Plans. Provide manufacturer's instructions to the Contractor. Do not place when the pavement surface temperature is below 50 ˚F.

2.7 PREFORMED COMPRESSION JOINT SEALANT

A. Material: ASTM Designation: D2628.

1. Number of cells: 5 or 6.
2. Lubricant Adhesive: ASTM Designation D2835.
3. Install compression seals along with lubricant adhesive according to the manufacturer's recommendations. Submit manufacturer's recommendations to the Contractor.

B. Accompany each lot of compression seal and lubricant adhesive by a Certificate of Compliance, storage instructions and precautionary instructions for use. Also submit the manufacturer's data sheet with installation instructions and recommended model or type of preformed compression seal for the joint size and depth as shown on the Plans. Show evidence that the selected seal is being compressed at level between 20 and 50 percent at all times for the joint width and depth shown on the Plans.

2.8 BACKER RODS

A. Provide backer rods that have a diameter prior to placement at least 25 percent greater than the width of the saw cut after sawing and are expanded, crosslinked, closed-cell polyethylene foam that is compatible with the joint sealant so that no bond, adverse reaction occurs between the rod and sealant. In no case use a hot pour sealant that will melt the backer rod. Submit a manufacturer's data sheet verifying that the backer rod is compatible with the sealant to be used.

2.9 SLIP RESISTIVE AGGREGATE FINISH

A. Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

PART 3 - EXECUTION

3.1 WATER SUPPLY

A. Provide water supply in accordance with Caltrans Standard Specification Section 10-6, Watering.

3.2 SUBGRADE

A. Prepare subgrade in accordance with Caltrans Standard Specification Section 40-1.03F, Placing Concrete.

3.3 SOIL STERILANT

A. Furnish and apply to areas indicated in accordance with Section 31 20 00, Earth Moving.

3.4 PLACING

A. Prepare concrete in accordance with Caltrans Standard Specification Section 40-1.03F, Placing Concrete.

3.5 SPREADING COMPACTING AND SHAPING

A. Conform to the following:

1. Stationary Side Form Construction: In accordance with Caltrans Standard Specification Section 40-1.03F(4), Stationary Side-Form Construction.
2. Slip Form Construction: In accordance with Caltrans Standard Specification Section 40-1.03F(4), Slip Form Construction.

3.6 INSTALLING TIE BARS

A. Install at longitudinal contact joints, longitudinal weakened plane joints, and transverse contact joints as shown on the Plans. In no case, shall any consecutive width of new

portland cement concrete pavement tied together with tie bars exceed 50 feet. In no case shall tie bars be used at a joint where portland cement concrete and asphalt concrete pavements abut.

B. Tie bars shall be installed at longitudinal joints by one of the 3 following methods:

1. Drilling and bonding in conformance with the details shown on the Plans. Provide a two-component, epoxy-resin, conforming to the requirements of ASTM Designation: C881, Type V. Grade 3 (Non-Sagging), Class shall be as follows:

Temperature of Concrete	Required Class of Epoxy Resin
Lower than 40° F	A
40˚ F through 60˚ F	B
Above 60˚ F	C

2. Provide, at least 7 days prior to start of work, a Certificate of compliance and a copy of the manufacturer's recommended installation procedure. The drilled holes shall be cleaned in accordance with the epoxy manufacturer's instructions and shall be dry at the time of placing the epoxy and tie bars. Immediately after inserting the tie bars into the epoxy, the tie bars shall be supported as necessary to prevent movement during the curing and shall remain undisturbed until the epoxy has cured a minimum time as specified by the manufacturer. Tie bars that are improperly bonded, as determined by the Contractor, will be rejected. If rejected, adjacent new holes shall be drilled, as directed by the Contractor, and new tie bars shall be placed and securely bonded to the concrete. All work necessary to correct improperly bonded tie bars shall be performed at the Contractor's expense.
3. Insert the tie bars into the plastic slip-formed concrete before finishing the concrete. Inserted tie bars shall have full contact between the bar and the concrete. When tie bars are inserted through the pavement surface, the concrete over the tie bars shall be reworked and refinished to such an extent that there is no evidence on the surface of the completed pavement that there has been any insertion performed. Any loose tie bars shall be replaced by drilling and grouting into place with epoxy as described in method 1 above at the Contractor's expense.
4. By using threaded dowel splice couplers fabricated from deformed bar reinforcement material, free of external welding or machining. Threaded dowel splice couplers shall be accompanied by a Certificate of Compliance and installation instructions. Installation of threaded dowel splice couplers shall conform to the requirements of the manufacturer's recommendations.

3.7 JOINTS

A. Construct joints in accordance with Caltrans Standard Specification Section 40-1.03B, Joints, except that tie bars shall be as specified under Part 1, Materials.

1. Construction Joints: In accordance with Caltrans Standard Specification Section 40-1.03B(2), Construction Joints.
    a. Construct a construction joint at the end of each day's work, or where concrete placement is interrupted for more than 30 minutes, to coincide with the next weakened plane joint location.
    b. If sufficient concrete has not been mixed to form a slab to match the next contraction joint, when an interruption occurs, the excess concrete shall be removed and disposed of back to the last preceding joint. The cost of removing and disposing of any excess concrete shall be at the Contractor's expense. Any excess material shall be become the property of the Contractor and shall be properly disposed of.
    c. A metal or wooden bulkhead (header) shall be used to form the joint. The bulkhead shall be designed to accommodate the installation of tie bars.
2. Contraction Joints: In accordance with Caltrans Standard Specification Section 40-1.03B (3), Contraction Joints, except that the insert method of forming joints in pavement shall not be used.

3.8 FINISHING

A. Finish concrete in accordance with Caltrans Standard Specification Section 40-1.03H, Finishing.

B. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on paving surface according to manufacturer's written instructions and as follows:

1. Uniformly spread 40 lb per 100 sq. ft. of dampened, slip-resistive aggregate over paving surface in two applications. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
2. Uniformly distribute approximately two-thirds of slip-resistive aggregate over paving surface with mechanical spreader, allow to absorb moisture, and embed by power floating. Follow power floating with a second slip-resistive aggregate application, uniformly distributing remainder of material at right angles to first application to ensure uniform coverage, and embed by power floating.

3.9 CURING

A. Cure concrete in accordance with Caltrans Standard Specification Section 40-1.03I, Curing.

3.10 SEALING JOINTS

A. Liquid Joint Sealant Installation.

1. The joint sealant detail for transverse and longitudinal joints, as shown on the Plans, shall apply only to weakened plane joints. Construct weakened plane joints by the sawing method. Should grinding or grooving be required over or adjacent to any joint after sealant has been placed, completely

remove the joint material and disposed of, and replace at the Contractor's expense. Recess sealant below the final finished surface as shown on the Plans.

2. At the Contractor's option, transverse weakened plane joints shall be either Type DSC or Type SSC as shown on the Plans. Longitudinal weakened plane joints shall be Type SSC only as shown on the Plans.
3. Seven days after the concrete pavement placement and not more than 4 hours before placing backer rods and joint sealant materials, clean the joint walls by the dry sand blast method and other means as necessary to completely remove from the joint all objectionable material such as soil, asphalt, curing compound, paint and rust. After cleaning the joint, remove all traces of sand, dust and loose material from and near the joint for a distance along the pavement surfaces of at least 2 inch on each side of the joint by the use of a vacuum device. Remove surface moisture at the joints by means of compressed air or moderate hot compressed air or other means approved means. Do not use drying procedures that leave a residue or film on the joint wall. Sandblasting equipment shall have a maximum nozzle diameter size of 1/4 $\pm$ 1/32 inches and a minimum pressure of 90-psi.
4. Install backer rod as shown on the Plans. Provide an expanded, closed-cell polyethylene foam backer rod that is compatible with the joint sealant so that no bond or adverse reaction occurs between the rod and sealant. Install backer rod when the temperature of the portland cement concrete pavement is above the dew point of the air and when the air temperature is 40°F or above. Install backer rod when the joints to be sealed have been properly patched, cleaned and dried. Do not use a method of placing backer rod that leave a residue or film on the joint walls.
5. Immediately after placement of the backer rod, place the joint sealant in the clean, dry, prepared joints as shown on the Plans. Apply the joint sealant by a mechanical device with a nozzle shaped to fit inside the joint to introduce the sealant from inside the joint. Apply adequate pressure to the sealant to ensure that the sealant material is extruded evenly and that full continuous contact is made with the joint walls. After application of the sealant recess the surface of the sealant as shown on the Plans.
6. Any failure of the joint material in either adhesion or cohesion of the material will be cause for rejection of the joint. Conform the finished surface of joint sealant to the dimensions and allowable tolerances shown on the Plans. Rejected joint materials or joint material whose finished surface does not conform to the dimensions shown on the Plans shall be repaired or replaced, at the Contractor's expense, with joint material that conforms to the requirements.
7. After each joint is sealed, remove all surplus joint sealer on the pavement surface. Traffic shall not be permitted over the sealed joints until the sealant is tack free and set sufficiently to prevent embedment of roadway debris into the sealant.

B. Preformed Compression Joint Seal Installation

1. The compression seal alternative joint detail for transverse and longitudinal joints, as shown on the Plans, shall apply only to weakened plane joints. Construct weakened plane joints by the sawing method. Should grinding or grooving be required over or adjacent to any joint after the compression seal has been placed, completely remove the joint materials and disposed of, and replace at the Contractor's expense. Compression seal shall be recessed below the final finished surface as shown on the Plans.
2. At the Contractor's option, transverse weakened plane joints shall be either Type DSC or Type SSC as shown on the Plans. Longitudinal weakened plane joints shall be Type SSC only as shown on the Plans.
3. Seven days after the concrete pavement placement and not more than 4 hours before placing preformed compression joint seals, clean the joint walls by the dry sand blast method and other means as necessary to completely remove from the joint all objectionable material such as soil, asphalt, curing compound, paint and rust. After cleaning the joint, remove all traces of sand, dust and loose material from and near the joint for a distance along the pavement surfaces of at least 50 mm on each side of the joint by the use of a vacuum device. Remove surface moisture at the joints by means of compressed air or moderate hot compressed air or other means. Do not use drying procedures that leave a residue or film on the joint wall. Sandblasting equipment shall have a maximum nozzle diameter size of 1/4 $\pm$ 1/32 inches and a minimum pressure of 90 psi.

3.11 PROTECTING CONCRETE PAVEMENT

A. Protect pavement in accordance with Caltrans Standard Specification Section 40-1.03J Protecting Concrete Pavement.

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SECTION 32 13 18

CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Materials for portland cement concrete

B. Aggregate and aggregate grading for portland cement concrete

C. Water for portland cement concrete

D. Admixtures for portland cement concrete

E. Proportioning for portland cement concrete

F. Mixing and transporting portland cement concrete

G. Formwork for cast in place portland cement concrete

H. Embedded materials for portland cement concrete

I. Placing and finishing portland cement concrete

J. Curing portland cement concrete

K. Protecting portland cement concrete

1.2 RELATED SECTIONS

A. Section 31 20 00, Earth Moving

B. Section 32 13 13, Concrete Pavement

1.3 RELATED DOCUMENTS

A. ASTM Standards
   1. C94, Standard Specification for Ready-mixed Concrete
   2. C150, Standard Specification for Portland Cement
   3. C260, Standard Specification for Air-Entraining Admixtures for Concrete
   4. C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
   5. C494, Standard Specification for Chemical Admixtures for Concrete.
   6. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for use in Portland Cement
   7. C1017, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

8. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
9. D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

B. Caltrans Standard Specifications, 2023
   1. Section 51: Concrete Structures
   2. Section 73: Concrete Curbs and Sidewalks
   3. Section 90: Concrete

1.4 DEFINITIONS

A. ASTM: American Society for Testing and Materials

1.5 SUBMITTALS

A. Follow submittal procedures outlined in Section 01 33 00, Submittal Procedures.

B. Concrete Mix Design: Have all concrete mixes designed by a testing laboratory and approved by the Consulting Engineer. Conform all mixes to the applicable building code requirement, regardless of other minimum requirements listed herein or on the Plans. Submit mix designs for review before use. Show proportions and specific gravities of cement, fine and coarse aggregate, and water and gradation of combined aggregates.

1.6 QUALITY ASSURANCE

A. Concrete shall be subject to quality assurance in accordance with Section 90 of the Caltrans Standard Specifications.
   1. Slump tests: Have available, at job site, equipment required to perform slump tests. Make one slump test for each cylinder sample, from same concrete batch. Allowable maximum slump shall be 4 inches for walls and 3 inches for slabs on grade and other work.

B. Certifications:
   1. Provide Contractor at the time of delivery with certificates of compliance signed by both Contractor and Supplier containing the following statements:
      a. Materials contained comply with the requirements of the Contract Documents in all respects.
      b. Proportions and mixing comply with the design mix approved by the Consulting Engineer. Design mix shall have been field tested in accordance with the herein requirements of the

Caltrans Standard Specifications and produces the required compressive strength under like conditions.

c. Statement of type and amount of any admixtures.

2. Provide Contractor, at time of delivery, with certified delivery ticket stating volume of concrete delivered and time of mixing, or time of load-out in case of transit mixers.

1.7 DESIGNATION

A. General: Whenever the 28 day compressive strength is designated herein or on the Plans is 3,600 psi or greater, the concrete shall considered to be designated by compressive strength. The 28 day compressive strength shown herein or on the plans which are less than 3,600 psi are shown for design information only and are not considered a requirement for acceptance of the concrete. Whenever the concrete is designated by class or as minor concrete herein or on the Plans, the concrete shall contain the cement per cubic yard shown in Section 90-2 of the Caltrans Standard Specifications.

B. Unless specified otherwise herein or on the Plans, portland cement concrete for curbs, gutters, sidewalks and their appurtenances such as island paving, curb ramps and driveways, shall be minor concrete as specified in Section 90-2 of the Caltrans Standard Specifications.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT

A. General: Type II or Type V cement conforming to the requirements of ASTM C150. Contractor may substitute pozzolan for portland cement in amounts up to 15% of the required mix unless high early strength concrete is specified. Pozzolan shall consist of Class F Fly Ash meeting the requirements of ASTM C618.

B. Color: Provide a coloring equivalent to ¼ pound of lampblack per cubic yard. Add to the concrete at the central mixing plant.

2.2 AGGREGATE AND AGGREGATE GRADATION

A. General: Fine and coarse aggregates shall be ¾ inch maximum size; clean and crushed aggregate free of materials which may cause staining. Aggregates shall conform to the requirements of section 90-1.02C of the Caltrans Standard Specifications.

B. Aggregate Size and Gradation: Conform to the requirements of section 90-1.02C(4)(d) of the Caltrans Standard Specifications for 1-inch maximum combined aggregate.

2.3 WATER

A. General: Water shall be clean, free from injurious amounts of oil, alkali, organic matter, or other deleterious material, and not detrimental to concrete per ASTM C94. Water shall conform to the requirements of section 90-1.02D of the Caltrans Standard

Specifications, for mixing and curing portland cement concrete and for washing aggregates.

2.4 CHEMICAL ADMIXTURES

A. Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain no more than 0.1 percent water-soluble chloride ions by mass of cementitious material. Admixtures shall conform to the requirements of section 90-1.02E of the Caltrans Standard Specifications and as noted herein or on the Plans.
    1. Air-Entraining Admixture: ASTM C260/C260M
    2. Water-Reducing Admixture: ASTM C494/C494M, Type A
    3. Retarding Admixture: ASTM C494/C494M, Type B
    4. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D
    5. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F
    6. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G
    7. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II

2.5 CLASSIFICATION OF PORTLAND CEMENT CONCRETE

A. Unless specified otherwise herein or on the Plans, portland cement concrete for the following items shall be designated as follows:
    1. Curbs, Gutters, and Sidewalks: Minor concrete.
    2. Cast in Place Concrete Pipe: The concrete shall consist of a minimum of 564 pounds of portland cement per cubic yard of concrete.
    3. Thrust Blocks: The concrete shall have a minimum compressive strength of 3,000 psi.
    4. Sign and Fence Footings: The concrete shall consist of a minimum of 376 pounds of portland cement per cubic yard of concrete.
    5. Water, Storm, and Sanitary Structures: The concrete shall consist of a minimum of 564 pounds of portland cement per cubic yard of concrete.

2.6 EXPANSION JOINT MATERIAL

A. Material for expansion joints in portland cement concrete improvements shall be premolded expansion joint fillers conforming to the requirements of ASTM D1751. Expansion joint material shall be shaped to fit the cross section of the concrete prior to being placed. Suppliers certificates showing conformance with this specification shall be delivered with each shipment of materials delivered to the job site. Unless specified otherwise herein or on the Plans, expansion joint thickness shall be as follows:
    1. Concrete Slope Protection, Gutter Lining, Ditch Lining and Channel Lining: ½ inch
    2. Structures: As indicated

2.7 DOWELS

A. Slip dowels, where noted or called for on the Plans or detail drawings shall be smooth billet-steel bars as designated and conforming to the requirements of ASTM A615 for

Grade 60 bars. Ends of bars inserted in new work shall be covered with a cardboard tube sealed with cork; no grease or oil shall be used.

B. Suppliers certificates showing conformance with this specification shall be delivered with each shipment of materials delivered to the job site.

2.8 CURING AND SEALING MATERIALS

A. Curing Compounds:
   1. Concrete surface repellent-vertical and/or flatwork: Repello surface treatment, invisible chemical treatment barrier system.
   2. Curing and sealing-exterior: Colorcure concrete cureseal manufactured by L.M. Scofield Company or approved equal. Color-matched, water-based curing and sealing compound that complies with ASTM C309.
   3. Color Conditioned Decorative Portland Cement Concrete: LITHOCHROME colorwax manufactured by L.M. Scofield Company or approved equal. Color-matched, water-based curing and sealing compound that complies with ASTM C309.

2.9 FORMS

A. Conform to the requirements of Section 73-1.03C and Section 90-1.03B(5) of the Caltrans Standard Specifications.

B. Tolerance: Not to deviate more than ¼ inch in 10 feet in grade and alignment.

2.10 PRECAST CONCRETE STRUCTURES

A. Conform to the following Sections of Caltrans Standard Specifications:
   1. 51-7, Minor Structures
   2. 70-5.02, Flared End Sections

2.11 CONCRETE VEHICULAR PAVEMENT

A. General: See Section 32 13 13, Concrete Pavement.

PART 3 - EXECUTION

3.1 STRUCTURAL EXCAVATION

A. Structural excavation may be either by hand, or by machine and shall be neat to the line and dimension shown or called for on the plans. Excavation shall be sufficient width to provide adequate space for working therein, and comply with CAL-OSHA requirements.

B. Where an excavation has been constructed below the design grade, refill the excavation to the bottom of the excavation grade with approved material and compact in place to 95% of the maximum dry density as determined by ASTM D1557.

C. Remove surplus excavation material remaining upon completion of the work from the job site, or condition it to optimum moisture content and compact it as fill or backfill on the site.

3.2 BRACING AND SHORING

A. Conform to California and Federal OSHA requirements.

B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the facility being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

C. Be solely responsible for all bracing and shoring and, if requested by the Owner's Representative, submit details and calculations to the Contractor. The Contractor may forward the submittal to the Consulting Engineer for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations related to the proposed facility shall precede a response to the submittal by the Contractor.

D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the position or operation of the facility being constructed or adjacent utilities and facilities.

3.3 PLACING CONCRETE FORMS

A. Form concrete improvements with a smooth and true upper edge. Side of the form with a smooth finish shall be placed next to concrete. Construct forms rigid enough to withstand the pressure of the fresh concrete to be placed without any distortion.

B. Thoroughly clean all forms prior to placement and coat forms with an approved form oil in sufficient quantity to prevent adherence of concrete prior to placing concrete.

C. Carefully set forms to the alignment and grade established and conform to the required dimensions. Rigidly hold forms in place by stakes set at satisfactory intervals. Provide sufficient clamps, spreaders and braces to insure the rigidity of the forms.

D. Provide forms for back and face of curbs, lip of gutters and edge of walks, valley gutters or other surface slabs that are equal to the full depth of the concrete as shown, noted or called for on the Plans. On curves and curb returns provide composite forms made from benders or thin planks of sufficient ply to ensure rigidity of the form.

3.4 MIXING AND TRANSPORTING PORTLAND CEMENT CONCRETE

A. Transit mix concrete in accordance with the requirements of ASTM Designation C94. Transit mix for not less than ten (10) minutes total, not less than three (3) minutes of which shall be on the site just prior to pouring. Mix continuous with no interruptions from

the time the truck is filled until the time it is emptied. Place concrete within one hour of the time water is first added.

B. Do not hand mix concrete for use in concrete structures.

3.5 PLACING PORTLAND CEMENT CONCRETE

A. Thoroughly wet subgrade when concrete is placed directly on soil. Remove all standing water prior to placing concrete.

B. Do not place concrete until the subgrade and the forms have been approved.

C. Convey concrete from mixer to final location as rapidly as possible by methods that prevent separation of the ingredients. Deposit concrete as nearly as possible in final position to avoid re-handling.

D. Place and solidify concrete in forms without segregation by means of mechanical vibration or by other means as approved by the Owner's Representative. Continue vibration until the material is sufficiently consolidated and absent of all voids without causing segregation of material. The use of vibrators for extensive shifting of fresh concrete will not be permitted.

E. Concrete in certain locations may be pumped into place upon prior approval by the Owner's Representative. When this procedure requires redesign of the mix, such redesign shall be submitted for approval in the same manner as herein specified for approval of design mixes.

3.6 PLACING ACCESSORY MATERIALS

A. Place water stops and other items required to be embedded in of portland cement concrete structures at locations shown or required in accordance with Section 51-2.04 of the Caltrans Standard Specifications unless otherwise specifically noted or called for on the Plans.

B. Curing Compounds:
   1. Regular Portland Cement Concrete: 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.

3.7 FORM REMOVAL

A. Remove forms without damage to the concrete. Remove all shores and braces below the ground surface, before backfilling.

B. Do not backfill against concrete until the concrete has developed sufficient strength to prevent damage.

C. Leave forms for cast-in-place walls in place at least 72 hours after pouring.

D. Leave edge forms in place at least 24 hours after pouring.

3.8 FIELD QUALITY CONTROL

A. Finish subgrade for concrete improvements shall be subject to approval prior to placement of forms.

B. No concrete shall be placed prior to approval of forms.

C. Concrete improvements constructed shall not contain "bird baths" or pond water and shall be smooth and ridge free.

D. Conform the finish grade and cross section of concrete improvements to the design grades and cross sections.

E. Variation of concrete improvements from design grade and cross section as shown or called for on the plans shall not exceed the tolerances ACI 117 and as follows:
    1. Elevation: ¼ inch.
    2. Thickness: Plus 3/8 inch, minus 1/4 inch.
    3. Surface: Gap below 10 foot long, unleveled straightedge not to exceed 1/4 inch.
    4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
    5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
    6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
    7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
    8. Joint Spacing: 3 inches, unless otherwise indicated.
    9. Contraction Joint Depth: Plus 1/4 inch, no minus.
    10. Joint Width: Plus 1/8 inch, no minus.

3.9 RESTORATION OF EXISTING IMPROVEMENTS

A. Replace in kind all pavement or other improvements removed or damaged due to the installation of concrete improvements.

B. Remove, landscaping or plantings damaged or disturbed due to the installation of concrete improvements. Replace in kind.

END OF SECTION

SECTION 33 41 00

STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Roadway and/or site storm drainage system up to five feet of any on-site building

1.2 RELATED SECTIONS

A. Section 31 21 00, Utility Trenching and Backfill

1.3 RELATED DOCUMENTS

A. AASHTO
   1. M252: Corrugated Polyethylene Drainage Pipe

B. ASTM
   1. D4101: Propylene Injection and Extrusion Materials
   2. F714: Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter
   3. F2648: Standard Specification for 2 to 60 inch Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications

C. Caltrans Standard Specifications, 2023
   1. Section 51, Concrete Structures
   2. Section 52, Reinforcement
   3. Section 70, Miscellaneous Drainage Facilities
   4. Section 75, Miscellaneous Metal
   5. Section 90, Concrete

1.4 DEFINITIONS

A. AASHTO: American Association of State Highway and Transportation Officials

B. ASTM: American Society for Testing Materials

C. HDPE: High-density polyethylene

D. NPS: Nominal pipe size

1.5 SUBMITTALS

A. Follow submittal procedure outlined in Section 01 33 00, Submittal Procedures.

B. Product data for the following:

1. Piping materials and fittings
2. Special pipe couplings
3. Joint sealants

C. Design Mix Reports and Calculations: For each class of cast in place concrete

D. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery and Storage
1. Piping: Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store plastic piping and jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.
2. Metal Items: Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

B. Handling
1. Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. When handling lined pipe, take special care not to damage linings of pipe and fittings; if lining is damaged, make satisfactory repairs. Carry, do not drag, pipe to trench.
2. Handle precast concrete pipe, manholes and other precast structures according to manufacturer's written instructions.
3. Protect imported bedding and backfill material from contamination by other materials.

PART 2 - PRODUCTS

2.1 PE PIPE AND FITTINGS (HDPE): 3 INCH THROUGH 10 INCH

A. Pipe shall be in accordance with AASHTO M252 Type S, smooth interior and corrugated exterior

B. Bell and spigot joints

C. Bell and Spigot Joint Gasket: Elastomeric seal, ASTM F477

D. Couplings: AASHTO M252, corrugated band type, engage a minimum of 4 corrugations, 2 on each side of pipe joint.

PART 3 - EXECUTION

3.1 PIPE INSTALLATION

A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer's instructions, and in accordance with Section 6 and 7 of ASTM D 2321 for plastic pipe, Caltrans Standard Specification Section 65-2.03 for reinforced concrete pipe, Caltrans Standard Specification Section 66-1.03 for corrugated metal pipe, and chapter 11.3.3 of AWWA M41 for cast iron and ductile iron pipe.

B. Pipe Depth and Trench Configuration: Conform to typical trench section(s) indicated.

C. Excavation, Bedding, Backfill, and Compaction: Section 31 21 00, Utility Trenching and Backfill

D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and placing; no chains or hooks will be permitted. Comply with the manufacturer's recommendations.

E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Start laying the pipeline at the low end and proceed upstream. Lay bell and spigot pipe with the bell end facing upstream. Lay pipe on a bed prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout its entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.

F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. Use shorter lengths of pipe than the standard length if necessary to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.

G. Closure: Close open ends of pipes and appurtenance at the end of each day's work or when work is not in progress.

3.2 SPECIAL PIPE COUPLINGS

A. General: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.

B. Installation: Manufacturers' instructions

3.3 PIPELINE FLUSHING

A. Newly constructed storm drain pipes shall be flushed with water to clean. A metal screen shall be used to collect and remove any rock, silt and other debris that is flushed out during cleaning.

END OF SECTION