CITY OF BERKELEY

**DEPARTMENT OF PARKS, RECREATION & WATERFRONT - CAPITAL PROJECTS**

# PROJECT MANUAL

Coastal Conservancy

## Berkeley Marina Docks D & E Replacement

### SPECIFICATION NO. 24-11633-C

**January, 2024**

**ADVERTISEMENT DATE: January 31, 2024**

**MANDATORY PRE-BID CONFERENCE: 11:00a.m., February 15, 2024**

**BID OPENING DATE: Tuesday, March 5, 2024**

**Approved by:**

**Scott Ferris**
**Director of Parks, Recreation and Waterfront**

**1947 CENTER STREET, 5th Floor, BERKELEY, CALIFORNIA 94704 (510) 981-6400**

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Document 00 0101

CITY OF BERKELEY

**DEPARTMENT OF PARKS, RECREATION & WATERFRONT**

# PROJECT MANUAL

## Berkeley Marina Docks D & E Replacement

**at**

**7 Spinnaker Way**
**Berkeley, CA 94720**

**SPECIFICATION NO. 24-11633-C**
**January, 2024**

**Prepared By:**

Jesus Espinoza, Associate Civil Engineer

**Reviewed By:**

Nelson Lam, Supervising Civil Engineer

**CAPITAL PROJECTS, WATERFRONT DIVISION**
**1947 CENTER STREET, 5TH FLOOR**
**BERKELEY, CALIFORNIA 94704**

**Project Manager**
**Jesus Espinoza, Associate Civil Engineer**
**Phone: (510) 981-6708**
**Email:** jespinoza@berkeleyca.gov

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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 **Tuesday, March 5, 2024** for the following public work:

**SPECIFICATION NO. 24-11633-C**
**CITY OF BERKELEY**
**Berkeley Marina Docks D & E Replacement**
**7 Spinnaker Way, Berkeley, CA 94720**

**1.02 Project Description:** Replacement of Marina Docks D & E, including demolition of existing docks, procurement and installation new dock float system, gangway, concrete piling, utilities and ancillary work in accordance with the terms and conditions of the Contract Documents. Work shall be completed within **180** Working Days from the date when Contract Time commences to run and per the breakdown below:

- **20 Total Working Days** - includes Phase 1 Demolition (in-water components) to be completed before October 15, 2024
- **160 Total Working Days** - includes Phase 2 Demolition (landside components), and all remaining scope of work, including installation of landside and waterside components and improvements

**1.03 Procurement of Bidding Documents:**
Bidding Documents contain the full description of the Work. Bidders may obtain Bidding Documents by January 31, 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, Jesus Espinoza, 1947 Center Street, 5th Floor, Berkeley, CA 94704, by Email at **jespinoza@berkeleyca.gov**.

**1.04 Planholders List:**

Bidders are responsible for notifying Jesus Espinoza, via email at jespinoza@berkeleyca.gov to be included on the Planholders List. Please include the following in the email subject header: "Planholders list for Specification No. 24-11633-C for Berkeley Marina Docks D & E Replacement". 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 on February 15, 2024 at 11:00 a.m. It is recommended that potential bidders visit the site independently to review site conditions prior to bid. Bidders are to meet in front of Docks D & E main entrance gate, located at 7 Spinnaker Way, Berkeley, CA 94720.

**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 **"A"** 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: Total Base 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** 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** 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 be subject to the First Source Construction Agreement (See Document 00 6580 – City of Berkeley Contracting Policies).

**2.07** This contract **WILL NOT** 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 7 Spinnaker Way, Berkeley, CA 94720, on February 15, 2024 at 11:00 a.m. It is recommended that potential bidders visit the site independently to review site conditions prior to bid. Bidders are to meet in front of the main gate to Docks D & E at 7 Spinnaker Way, Berkeley, CA 94720.

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: Berkeley Marina Docks D & E Replacement at 7 Spinnaker Way, Berkeley, CA 94720, Specification No. 24-11633-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. All Bids shall include all labor, materials, services, and equipment necessary for the completion of all Work shown on the plans, specifications, and other Contract Documents, including connections to existing systems, to provide a complete and finished project. Each Bid item shall include work as described, except for work separately requested under other Bid Items. Bid items are described in Section 01 1100 (Summary of Work). Quote in figures only, unless words are specifically requested.

## Base Bid

| ITEM | DESCRIPTION | PRICE ($) |
|---|---|---|
| 1 | General Provisions | |
| 2 | Mobilization & Demobilization | |
| 3 | Site Preparation | |
| 4 | Best Management Practices | |
| 5 | Demolition | |
| 6 | Offshore Marina and Appurtenances | |
| 7 | Landside Marina and Appurtenances | |
| 8 | Marina Utilities Infrastructure | |
| 9 | Accessibility Improvements and Landscaping | |
| 10 | Rip-Rap | |
| | **Total Bid Price:**<br>**Bid Items 1 though 10** | |

Total Bid Price: (Bid Items 1 Through 10)

_____

(Words)

## Bid Alternates

| ITEM | DESCRIPTION | PRICE ($) |
|---|---|---|
| BA1 | Additive Alternate 1:<br>4 ft Finger (1 total) x 35 ft long at Dock D –<br>includes installation of electrical pedestals and dock boxes at each slip (2 additional slips) | |
| BA2 | Additive Alternate 2:<br>4 ft Fingers (2 total) x 40 ft long each at Dock D -<br>includes installation of electrical pedestals and dock boxes at each slip (4 additional slips) | |
| BA3 | Additive Alternate 3:<br>4 ft Fingers (2 total) x 40 ft long each at Dock E -<br>includes installation of electrical pedestals and dock boxes at each slip (4 additional slips) | |
| BA4 | Additive Alternate 4:<br>4 ft Fingers (2 total) x 46 ft long each at Dock D -<br>includes installation of electrical pedestals and dock boxes at each slip (2 additional slips) | |

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. 24-11633-C
**Berkeley Marina Docks D & E Replacement**
at 7 Spinnaker Way, Berkeley, CA 94720**.**

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 00 4330**

**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. |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |

(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
**Berkeley Marina Docks D & E Replacement at**
**7 Spinnaker Way, Berkeley, CA 94720**

The Contract Sum of your contract is One Million Dollars and No Cents ($1,000,000.00).

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 TBD.

   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 **Jesus Espinoza** at **jespinoza@berkeleyca.gov.** Questions regarding bonds and insurance may be directed to **Jesus Espinoza** at the same number. All other inquiries regarding the Project should be directed to **Jesus Espinoza.**

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 **Professional Contractors Inc.** whose place of business is located at **TBD** ("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 24-11633-C**

**Berkeley Marina Docks D & E Replacement**
**at**
**7 Spinnaker Way, Berkeley, CA 94720**

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 $1,000,000.00 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 **150** working days from the Commencement Date.

B. Contractor shall achieve Final Completion of the entire Work **180** working days from the Commencement Date.

## ARTICLE 3 – PROJECT REPRESENTATIVES

### 3.01 CITY'S PROJECT MANAGER

A. City has designated Jesus Espinoza 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 **Jesus Espinoza** as its Project Manager to act as Contractor's Representative in all matters relating to the Contract Documents.

### 3.03 ARCHITECT/ENGINEER

A. **COWI** North America, Inc. furnished the Plans and Specifications and shall have the rights assigned to Architect/Engineer in the Contract Documents.

B. Architect/Engineer has designated James Connolly 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 two thousand dollars ($2,000.00) 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 two thousand dollars ($2,000.00) 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 |

| | |
|---|---|
| Specifications | Divisions 1 through 9 |
| Document 00 0115 | Maps, Drawings and Sketches |

**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)

Attest:
CITY OF BERKELEY

_____
City Clerk

_____
(Print Name)

**PROFESSIONAL CONTRACTORS INC.**

By: _____
(Signature)

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

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 - Berkeley Marina Docks D & E Replacement at 7 Spinnaker Way, Berkeley, CA 94720**

CONTRACT NO: TBD

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 submit:

1. Certified Safety Program and related information
2. Acknowledgement of applicable regulatory permits
3. Best Management Practices Plan
4. Obtain AIC letter during Power Service Application
5. Spill contingency plan for Hazardous Waste Spills
6. Work Schedule and Construction Staging Area Plan
7. Traffic & Pedestrian Control Plan
8. Demolition Plan
9. Pile Driving Plan
10. Special Inspections Solicitation Form #170

**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 **Professional Contractors Inc.** as Principal, Specification Number **24-11633-C,** dated the ____ day of _____, 20___ (the "Contract"), titled Berkeley Marina Docks D & E Replacement in the amount of TBD, which Contract is by this reference made a part hereof, for the work of the following Contract:

Replacement of Marina Docks D & E, including demolition of existing docks, procurement and installation new dock float system, gangway, concrete piling, utilities and ancillary work in accordance with the terms and conditions of the Contract Documents.

**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 **Professional Contractors Inc.** as Principal, Specification No. **24-11633-C** dated the _____ day of _____, 20__ (the "Contract"), titled Berkeley Marina Docks D & E Replacement in the amount of **TBD**, which Contract is by this reference made a part hereof, for the work of the following Contract:

Replacement of Marina Docks D & E, including demolition of existing docks, procurement and installation new dock float system, gangway, concrete piling, utilities and ancillary work in accordance with the terms and conditions of the Contract Documents.

**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, **Professional Contractors Inc.** ("Contractor"), whose place of business is located at **TBD** 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 Berkeley Marina Docks D & E Replacement located at **7 Spinnaker Way, Berkeley, CA 94720** in the amount of **$1,000,000.00** 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: **Jesus Espinoza, Project Manager, City of Berkeley**

| | |
|---|---|
| **PROJECT: Berkeley Marina Docks D & E Replacement**<br><br>**City's Specification No. : 24-11633-C** | **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 **Professional Contractors Inc.**("Contractor"), whose place of business is at **TBD**.

**RECITALS**

A. City and Contractor entered into Contract Number **TBD** (the "Contract") for construction of City **Berkeley Marina Docks D & E Replacement** located at **7 Spinnaker Way, Berkeley, CA 94720**.

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 [TBD ($TBD)] 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

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 Berkeley Marina Docks D & E Replacement located at 7 Spinnaker Way, Berkeley, CA 94720.

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
- Community Workforce Agreement, Agreement to be Bound (for projects over $500,000)
- 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<br>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

[None]

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# 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. 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.

F. Watercraft Liability (for private vessel) covering: a) vessels under 26 ft., **$1,000,000** combined single limit, b) vessels over 26' or vessel involved in research, **$2,000,000** combined single limit.

G. Property Insurance: 90% of full replacement cost of the facilities or structures

**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; and the **State of**

**California**, 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. The general liability and automobile liability policies must contain, or be endorsed to contain, the following provisions:

i. The State of California, its officers, agents, employees, and volunteers are to be covered as additional insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the grantee; and with respect to liability arising out of work or operations, including completed operations, performed by or on behalf of the grantee including materials, parts or equipment furnished in connection with the work or operations.

ii. For any claims related to this agreement, the grantee's insurance coverage shall be primary insurance as respects the State of California, its officers, agents and employees, and not excess to any insurance or self-insurance of the State of California.

iii. The limits of the additional insured coverage must equal the limits of the named insured coverage regardless of whether the limits of the named insurance coverage exceed those limits required by this agreement.

C. 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.

D. 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.

E. 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.

**END OF DOCUMENT**

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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 00700 (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 00700 (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 00700 (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. 24-11633-C**

**CITY OF BERKELEY**

BERKELEY MARINA DOCKS D & E REPLACEMENT

7 SPINNAKER WAY, BERKELEY, CA 94720

[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**

## 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 **Berkeley Marina Docks D & E Replacement** located at **7 Spinnaker Way, Berkeley, CA 94720**. The Work includes, without limitation, replacement of Marina Docks D & E, including demolition of existing docks, procurement and installation new dock float system, gangway, concrete piling, utilities and ancillary work. 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):

All bid items below (1 to 10) shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all work involved as described.

1. General Provisions – Shall include all the work as note Division 0 and Division 1 as well as any design service noted as deferred submittals.
2. Mobilization and Demobilization - Staging the work zone, final site cleaning, demobilization and other contract and regulatory requirements. Mobilization and demobilization not to exceed 10% of total bid price.
3. Site Prep – Includes clearing and grubbing, and setting up traffic control, barriers as necessary and specified in Section 01 5700 “Temporary Controls”.
4. Best Management Practices – Includes the implementation of Section 01 5700 “Temporary Controls” Section 01 7329 “Cutting and Patching”, Section 01 7413 “Project Cleaning” of the general Requirements, and other contract requirements including all regulatory requirements, on both land and offshore.
5. Demolition – Includes removal, off-hauling and disposal (including paying all associated disposal fees) of the existing dock components such as but not limited to: the existing abutment, treated timber pier and treated timber piles, gangway, marginal float, main float, typical fingers and end floats as specified in Section 022210 “Landscape Site Salvage” and Section 022250 “Structural Demolition” and per other regulatory requirements.
6. Offshore Marina and Appurtenances:

   Piles: Furnish and install both internally and externally 18” octagonal guide piles with pile caps as specified in Section 31 6213.20 “Precast Prestressed Concrete Piles”, and other contract requirements including all regulatory requirements.

   Floats: Furnish and install 10ft wide marginal walkway floats, 8ft wide marginal walkway floats, 8ft wide end floats, 6ft wide ADA fingers and 4ft wide typical fingers as specified in Section 35 5113.20 “Concrete Floating Dock Systems”.

   Gangway: Provide design, shop drawings for 80 ft gangway as well as furnish and install gangway as specified in Section 05 5013.01 “Aluminum Gangway”.

   Dock Lift Ladders: Furnish and Install dock lift ladders as note in contract drawings, Final location of ladders to be approved prior to installation.

7. Landside Marina and Appurtenances:

   Gate and Trellis: Furnish and install the gate and trellis as specified in contract drawings and as specified in Section 05 5000 “Metal and Hardware”, Section 05 5013 “Aluminum Pipe and Tube”, and Section 06 1333 “Preservative Treated Lumber”.

   Abutment and Abutment Wall: Cast In place all associated elements for the abutment and wall as specified in Section 03 3000 “Cast in Place Concrete”.

Concrete Walkway: Cast in place the concrete walkway as indicated in drawings as specified in Section 03 30000 “Cast in Place Concrete”

Restroom Fence Relocation and Repaving: Furnish and install fence extension as well as relocate existing fence as indicated on contract drawings. Fence post to be casted in concrete as specified in Section 03 30 00” Cast in Place Concrete”. Repave site to its existing use prior to disturbance.

8. Marina Utilities Infrastructure

Floats: Furnish and install all associated electrical, mechanical and fire utilities as specified throughout the contract drawings and technical specification and shall include but not limited to dock utility boxes, utility supports, fire cabinet supports, fire hose cabinets, etc.

Gangway: Furnish and install all associated electrical, mechanical and fire utilities as specified in contract drawings and as required per deferred submittal and shall include but not limited to utility conduits, utility supports, gangway lighting, etc.

Trenching: Furnish and install all associated electrical, mechanical, fire conduits for trenching. Trenching shall follow any necessary steps as specified in Section 31 2300.20 “Excavation and Fill” and Section 32 1216.16 “Road Mix Asphalt Concrete Pavement”.

Utility Concrete Pads: Cast In place all associated elements for the electrical, mechanical and fire concrete pads as specified in Section 03 3000 “Cast in Place Concrete”.

9. Accessibility Improvements and Landscaping

Site Furnishings: Furnish and install ADA domes, ADA cross stripping and bollards as specified in Section 12 9300 “Site Furnishings”.

Exterior Signage: Furnish and install all associated exterior signage as specified in Section 10 14 00.10 “Exterior Signage”.

10. Rip-Rap: Remove, stockpile and replace existing riprap once abutment wall has been cast in place as specified in Section 35 3119.13 “Rock Slope Protection”.

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 Alternates:

BA1. Additive Alternate 1: 4 ft Finger (1 total) x 35 ft long at Dock D – furnish and install fingers, including Newport electrical pedestals and dock boxes at each slip (2 additional slip)

BA2. Additive Alternate 2: 4 ft Fingers (2 total) x 40 ft long each at Dock D – furnish and install fingers, including Newport electrical pedestals and dock boxes at each slip (4 additional slips)

BA3. Additive Alternate 3: 4 ft Fingers (2 total) x 40 ft long each at Dock E – furnish and install fingers, including Newport electrical pedestals and dock boxes at each slip (4 additional slips)

BA4. Additive Alternate 4: 4 ft Fingers (2 total) x 46 ft long each at Dock E – furnish and install fingers, including Newport electrical pedestals and dock boxes at each slip (4 additional slips)

## 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. Dredging under Docks D&E to take place after removal of existing docks. Dredging is not part of this contract and will be performed by City under a separate contract.

## 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.

B. **Special operational constraints include the following**:

1. Contractor to perform Phase 1 Demolition (removal of in-water components such as end float, main floats, marginal floats, timber piles, gangway, gate, and timber pier, as shown on Plan Sheet D-100 Demolition) by **October 15, 2024**. Contractor shall then allow City to perform dredging under Docks D&E prior to Contractor installing of new docks. Dredging operations expected to require 2 weeks to complete. Contractor shall reflect sequence on their Project Schedule and lookahead schedule and shall provide City with at least 2 weeks' notice prior to demolition and removal of docks.

## 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 the A-E parking lot on the south side of Spinnaker Way. The entrance to the existing Docks D&E is protected with a gate. Contractor shall obtain key fob from the City.

B. Contractor shall contact City at least 10 Business Days prior to entering the Marina Harbor to access docks D&E and performing Work to allow City to arrange access into the docks. Access Request forms shall be submitted 72 hours 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. None

## 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 site (if applicable) 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
4. National Marine Fisheries Service (NMFS) Letter of Concurrence (LOC) – Under Review
5. U.S Army Corps of Engineers (USACE) Nationwide Permit (NWP) – Under Review
6. Regional Water Quality Control Board (RWQCB) 401 Water Quality Certification (WQC) – Under Review
7. Bay Conservation and Development Commission (BCDC) permit – Under Review

B. All other permits that may be required, such as electrical, mechanical, fire prevention, irrigation, grading, slope protection, tree cutting, construction waste management plan, 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 violation of legal or regulatory requirements where the violations result from Contractor's activities. Violations or threatened violations may subject City to fines per Day 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.

## 2. PRODUCTS

### 2.03 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.

### 2.04 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**

### 2.05 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.

## 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.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

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DIVISION 1 GENERAL REQUIREMENTS

**SECTION 01 2600**

**MODIFICATION PROCEDURES**

## 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).

## 2. PRODUCTS – NOT USED

## 3. EXECUTION – NOT USED

**END OF SECTION**

[COST PROPOSAL FORM FOLLOWS ON NEXT PAGE]

**COST PROPOSAL (CP)**

Owner **Berkeley Marina Docks D & E Replacement**
Contract Number _____

**CP Number:** _____
**Date:** _____
**In Response To** _____
RFP #, etc.

**To: City of Berkeley**
Attention: **Jesus Espinoza**
**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**

## 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.

## 2. PRODUCTS – NOT USED

## 3. EXECUTION – NOT USED

**END OF SECTION**

# DIVISION 1 GENERAL REQUIREMENTS

# SECTION 01 3230

# PROGRESS SCHEDULES AND SUBMITTALS

## 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.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

# DIVISION 1 GENERAL REQUIREMENTS

# SECTION 01 3300

# SUBMITTALS

## 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.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

DIVISION 1 GENERAL REQUIREMENTS

**SECTION 01 4100**

**REGULATORY REQUIREMENTS**

## 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.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

DIVISION 1 GENERAL REQUIREMENTS

**SECTION 01 4200**

**REFERENCES AND DEFINITIONS**

## 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.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

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DIVISION 1 GENERAL REQUIREMENTS

**SECTION 01 4500**

**TESTING AND INSPECTION**

## 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: None

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.

## 2. PRODUCTS – NOT USED

## 3. EXECUTION – NOT USED

**END OF SECTION**

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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 solely 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 be 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**

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. Plumbing fixtures.
r. Piping.
s. Supports and hangers.
t. Valves.
u. Sprinklers.
v. Mechanical equipment.
w. Refrigerants.
x. Electrical conduit.
y. Copper wiring.
z. Lighting fixtures.
aa. Lamps.
bb. Ballasts.
cc. Electrical devices.
dd. Switchgear and panelboards.
ee. 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. Piping.
j. Electrical conduit.
k. 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.

## 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.

## 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. Delete Architect/Engineer title block and seal from documents.

F. As-Built Documents are subject to review and acceptance by the City and Architect/Engineer.

G. 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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# SECTION 02 8200
# ASBESTOS ABATEMENT

## PART 1 GENERAL

### 1.01 SUMMARY

A. Section Includes:
   1. Removal, repair, encapsulation, enclosure and other abatement of asbestos-containing materials as specified herein and shown on drawings.
   2. Compliance with all applicable Federal, State, and local regulations pertaining to work practices.
   3. Protection of workers, visitors to the site, and persons occupying areas adjacent to the site.
   4. Provide medical examinations and maintain medical records of personnel as required by the applicable Federal, State, and local regulations.
   5. The scope of this work includes the manifesting, transporting, or disposal of hazardous waste.
   6. Refer to the Available Documentation listed in Section 01 1100 "Summary of Work" Article 1.16 "Geotechnical Data and Existing Conditions".

B. Related Sections:
   1. Division 01 Section "General Requirements"
   2. Division 02 41 16 “Selective Building Demolition”
   3. Division 09 90 00 "Painting and Coating"

### 1.02 DEFINITIONS

A. Asbestos-In-Construction Supervisor (Competent Person): One who is capable of identifying existing and predicting asbestos hazards in the surroundings or working conditions and who has the authorization to take prompt corrective measures to eliminate them.

B. Asbestos 30 minute Excursion Limit (EL): 1.0 fiber per cubic centimeter of air (1.0 f/cc).

C. Asbestos-in-air, 8 hour Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 0.1 fiber per cubic centimeter of air (0.1 f/cc).
   1. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

### 1.03 SUBMITTALS

A. Submit under provisions of Division 01 Section "General Requirements" for review and approval by the City of Berkeley’s Project Manager.

B. Product Data: Submit [five (5)] copies of the following:
   1. Material Safety Data Sheets (MSDS) sheets for each product containing hazardous materials as defined by OSHA’s Hazardous Communication Standard; 29 CFR 1910.1200.
   2. Test reports for materials impacted by new work and assumed to contain asbestos that were not tested in previous reports but identified in the Available Documentation in Section 01 1100.

C. Quality Assurance/Control Submittals: Submit [five (5)] copies of the following:
   1. Asbestos Compliance Work Plan: Detailed, job-specific plan of the procedures proposed for use in complying with the requirements of this Specification and 29 CFR 1926.1101.
      a. As a minimum, provide the information required in Attachment A, the Asbestos Compliance Work Plan Outline.
      b. The plan shall be approved by the City of Berkeley prior to the mobilization of equipment, supplies, or workers to the site.
   2. Worker Certification: Current asbestos worker certifications for personnel to be engaged in the work of this Section. Workers will not be permitted on the project site until the submittal is complete and has been accepted by the Project Manager. Provide the following information for each worker:
      a. Employee quantitative respirator fit-test records that identify the testing agency, the individual fit test exercise fit factor results, and the overall fit factor result;
      b. Employee medical approval to wear respirator protection records;

c. Current AHERA-certified asbestos contractor supervisor certificate(s) and training for the designated contractor supervisor only;
d. Current AHERA-certified asbestos worker certificate(s) and training; and
e. Employee picture identification matching names on records. Picture IDs can be photo copies of training cards; however, pictures of employee faces must be viewable vs. dark images from poor quality photo copying.

3. Subcontractor License: Submit proof of license for asbestos-related contracting from the California Contractors State License Board (CSLB) as required by California Business and Professions Code, Section 7058.5 et.seq.
4. Subcontractor Registration: Submit proof of registration with the California Division of Occupational Safety and Health (DOSH) for asbestos-related work as required by Title 8 CCR, Sections 341.6 to 341.9.
5. Carcinogen Registration: Submit proof of carcinogen registration (report of use) with DOSH as required by California Labor Code, Section 9000 et. seq.
6. Bay Area Air Quality Management District (BAAQMD) Notification: Submit proof of notification made to the BAAQMD, 10 working days prior to asbestos demolition or renovation activities, as required by BAAQMD Regulation 11, Rule 2. Subcontractor shall update and resubmit notifications as needed due to changes in the project schedule or material quantities. The subcontractor shall be responsible for obtaining variances from the BAAQMD as necessary.
7. Respiratory Protection Program: Submit company's Respiratory Protection Program.
8. Written record from negative air machine and HEPA vacuum cleaner challenge aerosol testing on the day of the testing.
9. Per 29 CFR 1926.1101 (f)(5), the subcontractor shall notify their employees of exposure monitoring results within 5 days of receiving the results including both excursion and calculated 8-hour TWA results for all results, not just those results above the PEL or excursion limit.

D. Closeout / Ongoing Project Submittals
1. Personal air sampling results collected by the asbestos abatement subcontractor for airborne asbestos within 24 hours of sample collection.
2. Pressure differential recorder readings shall be submitted in written form (i.e., circular chart or other form of print out).

E. All submittals will be provided to the City of Berkeley three (3) working days prior to mobilization for each individual site job and must be approved prior to work commencing.

**1.04 QUALITY ASSURANCE**

A. Qualifications:
1. Qualifications of Subcontractor:
a. Work performed under this Section shall be by a single Subcontractor.
b. The Subcontractor shall have a minimum of five (5) years experience as an approved asbestos abatement subcontractor. If requested, the Subcontractor shall provide the names and locations of 5 projects of similar size and scope that he has completed within the previous five years.
c. The Subcontractor must hold a current and valid asbestos license issued by the California Contractors State Licensing Board (CSLB).
d. The Subcontractor must hold a current and valid Certificate of Registration for Asbestos-Related Work issued by the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA).
e. The Subcontractor must hold all insurance and bonds as required by other sections of this specification, and maintain as valid and current for the duration of the project.
2. Qualifications of Asbestos Abatement Personnel:
a. All work shall be completed utilizing fully qualified persons who are trained, experienced, and knowledgeable in the proper techniques and procedures for asbestos abatement activities covered by this Section.
b. Asbestos Workers: All workers performing asbestos related work shall be currently certified as AHERA asbestos workers.

c. Asbestos in Construction Contractor Supervisor: Currently certified as an AHERA Asbestos Contractor Supervisor.

3. Qualifications of Analytical Laboratory:
   a. The subcontractor shall submit asbestos air samples to an analytical laboratory that is accredited by the American Industrial Hygiene Association's (AIHA) Industrial Hygiene Laboratory Accreditation Program (IHLAP). The subcontractor shall choose another AIHA accredited lab if their current AIHA accredited lab does not maintain accreditation throughout the duration of this project.

B. Regulatory Requirements: All asbestos removal work shall be performed in accordance with requirements of Federal, state, and local regulations as follows:
   1. Federal Regulations:
      a. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA):
         1) Asbestos Standard: Title 29, Part 1910, Section 1001
         2) Respiratory Protection: Title 29, Part 1910, Section 134
         3) Construction Industry: Title 29, Part 1926, Section 1101
         4) Hazard Communication: Title 29, Part 1910, Section 1200
      b. U.S. Environmental Protection Agency (EPA):
         1) Resource Conservation and Recovery Act (RCRA):
            (a) Title 40, Part 260 to 265
            (b) U.S. Department of Energy 10 CFR 851 Worker Protection Rule
   2. U.S. Environmental Protection Agency (EPA):
      a. Worker Protection Rule
         1) 40 CFR Part 763, Subpart G
         2) CPTS 62044, FLR 2843-9
         3) Federal Register, Vol. 50, No. 134, 7/12/85
         4) P28530-28540
      b. Regulation for General Industry:
         1) Title 40, Part 61, Subpart A of the Code of Federal Regulations
      c. National Emissions Standard for Hazardous Air Pollutants (Asbestos):
         1) Title 40, Part 61, Subpart M of the Code of Federal Regulations including Asbestos NESHAP Revision; Final Rule, Federal Register; Tuesday, November 20, 1990.
      d. Asbestos Hazard Emergency Response Act: Final Rule:
         1) Title 40, Part 763, Subpart E of the Code of Federal Regulations.
   3. State and Local Regulations: Abide by all State and local regulations which govern asbestos abatement work or storage of asbestos waste materials:
      a. Asbestos in General Industry:
         1) Title 8, Section 5208, of the California Code of Regulations.
      b. Asbestos in the Construction Industry:
         1) Title 8, Section 1529, of the California Code of Regulations.
      c. Respiratory Protection:
         1) Title 8, Section 5144, of the California Code of Regulations.
      d. Medical and Environmental Records
         1) Title 8, Section 3204, of the California Code of Regulations
      e. Registration and Permits
         1) Title 8, Section 341, of the California Code of Regulations
   4. Bay Area Air Quality Management District (BAAQMD):
      a. Regulation 11 Rule 2

C. Pre-Construction Meeting: At least one week before work commences, a pre-construction meeting shall be held at a location designated by the City of Berkeley's Project Manager. Attendees shall include the City's Project Manager, Construction Manager, Superintendent, Safety Inspector, and Building Inspector; the Subcontractor's Project Superintendent and Abatement Superintendent; and others as necessary. The agenda shall include a review of project safety requirements, the Subcontractor's written asbestos compliance work plan, emergency contacts and notification plan, containment and

work area design, facility requirements, submittals, and any other issues pertinent to the safe execution of the asbestos abatement work.

1. Work shall not commence until all required submittals and plans have been approved by the City of Berkeley.

**1.05 PROJECT CONDITIONS**

A. Existing Conditions:
   1. Building materials that contain asbestos are known to be present at the Project site. Building materials that have not been previously tested, that may be affected by the project scope, should be assumed to contain asbestos and handled according to this section.
      a. If any other materials are found which are suspected of containing asbestos or other hazardous materials, immediately stop work in the affected area and notify the City of Berkeley's Project Manager. Handle suspected asbestos containing material according to this section.
      b. It is the responsibility of the Subcontractor to test these materials before commencing work and provide test results to the City of Berkeley's Project Manager. Removal of all asbestos containing materials impacted by the proposed work scope will be in the abatement scope and identified in the "Work Plan".
   2. The City of Berkeley will not occupy adjacent areas during the course of the Work.
   3. The abatement subcontractor is responsible for notifying other subcontractors in writing regarding asbestos work per OSHA requirements (29 CFR 1926.1101).

**PART 2 PRODUCTS**

**2.01 MATERIALS**

A. Plastic Sheeting: Fire retardant polyethylene sheeting conforming to NFPA 701 and ASTM S502-74T for surface flammability and smoke density. A single polyethylene film in the largest sheet size possible to minimize seams, 6 mils thick, clear, frosted or black as indicated.

B. Duct Tape: Provide duct tape in 2" or 3" widths as indicated, with an adhesive which is formulated to stick aggressively to polyethylene sheeting.

C. Spray Adhesive: Shall not contain methylene chloride, as listed on the product's label and/or Material Safety Data Sheet (MSDS). Provide spray adhesive in aerosol cans that is specifically formulated to stick aggressively to polyethylene sheeting.

D. Disposal Bags: 6-mil polyethylene.

E. Asbestos-Containing Materials Disposal Containers: Leak-tight drums procured by abatement subcontractor.

F. Detergent: High-phosphate wash containing at least 5% trisodium phosphate (TSP).

**2.02 EQUIPMENT**

A. Clothing: Furnish the following for each worker and others as specified.
   1. Coveralls:
      a. Disposable full-body coveralls with attached head and foot covers conforming to requirements of OSHA Standards 29 CFR 1926.1101.
   2. Respirators:
      a. Full facepiece negative pressure respirators with an assigned protection factor of 50X the PEL, or equivalent, for asbestos related work.
      b. Respirators shall be equipped with HEPA (P-100) Filters.
      c. Powered Air Purifying Respirators (PAPRs) with protection factors of 50X that have been quantitatively fit tested and equipped with HEPA (P-100) filters shall be acceptable substitutes for the respirator specified in 2.02(A)(2)(a) and must be worn for Class 1 work involving TSI or surfacing materials.
   3. Goggles, safety glasses, face shields: Provide eye and face protection as required by OSHA.
   4. Gloves:

a. Leather work gloves.
b. Compatible chemical resistant gloves for asbestos removal/solvent products.

5. Boots: Steel toed foot protective work boots with non-skid soles and steel shanks.
6. Hard Hats: Head protection (hard hats) approved by ANSI.
7. Soap and Towels.

B. Industrial Grade Vacuum and Negative Air Machines: High Efficiency Particulate Air (HEPA) filtered vacuum and negative air machines with appropriate HEPA filters and prefilters. Household type HEPA vacuum cleaners shall not be acceptable. Provide one spare negative air machine per work area at all times. Spare negative air machines shall be of the same size and capacity as the largest operating units onsite.

C. Pressure differential recorders shall be in working condition, calibrated and operated continuously during the operation of the negative pressure enclosure and provide a pressure reading at least every 10 minutes, or more frequent.

D. Temporary Shower Facility: A pre-fabricated or site-built temporary shower facility, with hot and cold water to shower head that can be controlled from inside shower, shall be installed and used by all workers.

## PART 3 EXECUTION

### 3.01 PROTECTION

A. General:

1. Take appropriate continuous measures as necessary to protect all building occupants from exposure to asbestos fibers. Such measures shall include the procedures and methods described herein, and shall be in accordance with regulations and guidelines of applicable Federal, State, and local agencies.
2. Securing the Work Area: Secure the work area from access by the public, occupants, staff, or users of the building.
   a. Provide and maintain temporary partitions to prevent spread of dust, fumes, odors, and noise to permit continued City occupancy.
   b. Demarcate the regulated work area, as required by OSHA regulation 29 CFR 1926.1101, by posting warning signs at each locked door and at the entrance to the change room leading to the regulated area as follows:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN THIS AREA

   c. Provide labels affixed to all asbestos waste containers, as required by OSHA regulation 29 CFR 1926.1101, as follows:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

3. Do not block, or reduce width, of egress to exits.
4. Conduct operations with minimum interference to corridors, exits, and public thoroughfares.
5. Path of travel for debris removal shall be maintained dust free and clean at all times.
6. Cover and protect windows, doors, and walls that are adjacent to asbestos work areas.
7. Water used during this project shall be collected and prevented from entering storm water drains.
8. Eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics is prohibited in the work area.

B. Personnel:
1. Asbestos Contractor Supervisor (Competent Person):
a. Provide an on-site, full-time Asbestos in Construction Supervisor (or Supervisors) to ensure that the worker protection program and engineering controls are effective. The Supervisor is also responsible for understanding City of Berkeley and Alameda County waste management policies.
2. Asbestos Workers: The Subcontractor shall communicate information concerning asbestos hazards according to the requirements of the Hazard Communication Standard (29 CFR 1910.1200), including but not limited to the requirements concerning warning signs and labels, material safety data sheets (MSDS), and employee information and training.
3. Respiratory Protection Program: Comply with ANSI Z88.2 - 1992 "Practices for Respiratory Protection" and OSHA 29 CFR 1926.62.
a. Require that respiratory protection be used at all times when there is any possibility of disturbance of asbestos containing material.
b. Down grading respiratory protection to a lower level protection factor is not allowed even with objective data to support the down grade.
4. Protective Clothing:
a. The following clothing shall be worn by all asbestos workers in the work area.
1) Disposable Coveralls with head and shoe covers (except for welders): Provide a sufficient number for all required changes for all workers in the work area. Dispose of coveralls as clothing waste at the end of each day.
2) Gloves: Chemical resistant gloves shall be used when using solvents to remove mastic material. Gloves shall be secured to coveralls using duct tape to protect arms and hands. Do not remove gloves from the work area.
3) Goggles, safety glasses, or face shields: Shall be worn by all workers involved in scraping, spraying, stripping, or any other activity that may potentially cause eye or face injury.
5. Temporary Shower Facilities: Shall be used in accordance with subsection 2.02 (C) and subsection 3.08 (C) of this section.

## 3.02 GENERAL PROCEDURES

A. Containment Systems:
1. If at any time during the course of the work visual emissions are detected, the Subcontractor shall immediately stop work, correct the condition(s) causing the emission, and notify the City of Berkeley's Project Manager.
2. In case of inclement weather, such as high winds or rain, which may jeopardize the containment system, immediately secure the work area and stop work until weather conditions improve.

## 3.03 WORK AREA PROCEDURES

A. No visitors shall be allowed in work area, except as authorized by the City of Berkeley's Project Manager.

B. Provide workers with sufficient sets of disposable protective full-body clothing. Such clothing shall consist of full-body coveralls, footwear, and head gear as one-piece coveralls. Provide eye protection and hard hats as required by applicable safety regulations. Reusable type protective clothing and footwear intended for reuse shall be left in the Contaminated Equipment Room until the end of the asbestos abatement work at which time such items shall be disposed of as asbestos waste. Disposable clothing shall not be allowed to accumulate and shall be disposed of as contaminated waste.

C. Do not enter occupied building areas while wearing either new or contaminated disposable coveralls or respirators. Provide a visual barrier between the asbestos related work area and occupied areas.

D. Provide additional make-up air openings as necessary to effectively move air through the work area and to avoid creating too high a pressure differential that would jeopardize the integrity of the enclosure system. Provide self-closing polyethylene flaps over the openings to prevent backflow of air from the contained area t the outside.

E. Vent all exhaust units to the outside of the building. Provide flexible or rigid duct as necessary to provide exterior venting and proper location of exhaust units. Ducts shall be completely sealed, in good repair, and protected from possible damage within the work area. "Make-shift" type ducting made from poly and spray glue will not be acceptable. New ducting shall be used for each new containment system.

F. After asbestos removal has begun, maintain operation of exhaust units continuously to maintain a constant negative pressure until final clearance results are achieved. Do not turn units off at the end of the work shift or when removal operations temporarily stop. Ensure arrangements are made with subcontractor employees to visit and make repairs to the NPE during after hours or on weekends as necessary.

**3.04 ASBESTOS REMOVAL PROCEDURES**

A. Asbestos removal: Remove asbestos containing material as described in the contractor's asbestos compliance work plan prior to disturbing the substrate. Modifications to this plan shall be reviewed and approved by the City of Berkeley's Project Manager prior to work continuing.
   1. Prohibited Asbestos Removal Methods:
      a. Removing mastic material with methylene chloride-based products
      b. Uncontained abrasive blasting
      c. Uncontained power washing
      d. Dry sanding or scraping
      e. Power sanding without HEPA attachment

B. Asbestos abatement operations shall include all tasks necessary for the proper and complete abatement of the materials in the scope of work. Tasks include, but are not limited to, the following:
   1. Preparation of work areas, including pre-cleaning, isolation of HVAC equipment, establishment of critical barriers and isolation barriers, establishment of negative pressure enclosures as needed, protection of building equipment, life safety systems, and electrical equipment and systems.
   2. Providing water and waste services to work areas, including hot and cold-water supply for abatement-related work, and proper filtering of wastewater for disposal.
   3. Maintaining adequate negative air pressure (minimum of - 0.02"w.g) and at least four air changes per hour as needed.
   4. Protecting and maintaining active, as applicable, all life safety systems and building equipment operation.
   5. Removing asbestos-containing materials and decontamination of asbestos-contaminated surfaces, equipment, and areas.
   6. Encapsulating asbestos-containing materials and/or surfaces possibly contaminated with asbestos fibers, using penetrating and/or bridging encapsulants.
   7. Proper storage of asbestos-containing waste, including packaging and labeling. Once a full 55-gal drum of friable asbestos waste is generated, it must be moved into a 90-day Hazardous Waste Accumulation Area (WAA) within three days.
   8. Cleaning work areas and surfaces as necessary to achieve acceptance by final visual inspection and final clearance air monitoring.
   9. Coordinating work with other Subcontractors, City crews, staff, inspectors, and representatives.
   10. Upon completion of all work area preparation, and not less than four hours before abatement work is to begin, notify the City's Project Manager that the work area is ready for inspection.
   11. The Subcontractor shall not begin abatement work until the City's Industrial Hygienist has inspected the area and deficiencies have been corrected.

C. Waste Disposal: HEPA vacuum and/or wet wipe to remove all asbestos or contaminated debris generated during the work. Do not allow asbestos material to accumulate. Place all asbestos containing material and contaminated debris in properly labeled plastic disposal bags at the end of each

shift. This waste must be labeled and disposed of off site in accordance with Alameda County protocols and guidelines.

**3.05 FIELD QUALITY CONTROL**

A. Site Tests:
   1. Respiratory protective equipment shall be quantitatively fit tested, including PAPR units. Qualitative fit test using irritant smoke tests or other qualitative test methods shall not be acceptable.
   2. All HEPA vacuums and negative air machines (including spare negative air machines) shall be challenge tested, by emery oil aerosol or equivalent, and certified as in "passing" condition prior to work commencing. Negative air machines and HEPA vacuums shall be tested every three months, and immediately after changing HEPA filters, and remain onsite during the duration of the project. HEPA vacuums and negative air machines shall not be used after changing HEPA filters until they have been tested by a challenge aerosol.

B. Inspection (Asbestos Air Monitoring):
   1. Personal Exposure Monitoring Results: Subcontractor shall provide personal air monitoring of its employees, in accordance with requirements of 29 CFR 1926.1101. Per 1.05 (A)(3)(a) of this section, the Subcontractor shall submit air samples to an analytical laboratory accredited by the American Industrial Hygiene Association (AIHA) for analysis by Phase Contrast Microscopy (PCM) per NIOSH method 7400.
      a. The personal air monitoring data shall include the employee's name, date of monitoring, task(s) performed, employees represented by the monitoring, analytical result, and time-weighted average exposure.
      b. The analytical lab results shall be submitted to the City's Project Manager within 24 hours of sample collection.

**3.06 CLEANING**

A. Daily Cleaning: Thoroughly clean the entire area under active asbestos disturbance at the end of each workday.
   1. At end of work shift remove any asbestos containing material or debris by using a HEPA vacuum or by spraying with wet wash solution, collect debris with wet paper towels or equivalent, place in disposal bag while still wet, and clean surface of plastic sheets with wet paper towels or equivalent.
   2. Exterior Cleanup:
      a. Examine immediate area to ensure that no asbestos debris has escaped containment. Debris shall be placed in double plastic bags, sealed and stored with other contaminated debris.

**3.07 PROJECT CLEARANCE**

A. Upon completion of asbestos removal, placement of removed asbestos material and debris per City of Berkeley and County of Alameda hazardous waste disposal protocols and final HEPA vacuuming of surfaces, notify the City's Project Manager that the abatement area is ready for post abatement visual inspection.

B. The work area shall have passed post abatement visual inspection prior to post removal encapsulation. Negative air must continue to run and workers must remain in specified respiratory protection.

C. An approved encapsulant shall be applied, using airless spraying equipment, to all areas of the project where asbestos-containing materials have been removed. Encapsulants shall be colored for ready visibility.

D. Upon completion of encapsulation of surfaces from which asbestos has been removed (allowing for at least two hours for encapsulant to dry), the Subcontractor shall inform the City's Project Manager that the area is ready for clearance monitoring.

E. The Subcontractor shall not tear down / remove the negative pressure enclosure or negative air machines until verbal notice has been given to the Subcontractor by the City's Project Manager.

**3.08 STORAGE OF WASTE MATERIALS**

A. Waste Evaluation: The materials collected from the cleaning operations must be evaluated to determine if the materials are hazardous and require special handling. The Subcontractor is responsible

for segregating waste as it is generated and labeling all waste containers appropriately. Stored waste must be labeled with the accumulation date, type of waste, and area from which it was generated. All materials are to be contained in one of the following:

1. Two properly sealed 6-mil disposal bags labeled with a hazardous waste label in addition to the required OSHA specified asbestos warning label.
2. Wrapped in 6-mil polyethylene sheeting and sealed with duct tape. Wrapped waste must be properly labeled with as hazardous waste label in addition to the required OSHA specified asbestos warning label.

B. If a dumpster is to be located on site for the duration of the project, arrange location of the dumpster with the Project Manager.
   1. Do not store containerized materials outside of the work area. Take containers from the work area directly to an approved disposal site. All open dumpsters are prohibited for any construction debris. Take special care in transporting the waste materials from the location of generation to the disposal facility.

C. Treatment and Testing of Project Waste Water: The handling and treatment of project waste water must conform with all State and local regulations. Project waste water includes shower water and waste water from cleaning operations.
   1. The Subcontractor shall not discharge waste water containing asbestos into a community sanitary sewer as per the requirements of the San Francisco Bay Basin Water Quality Control Plan. All waste water shall be discharged into a sanitary filter. Do not discharge any waste water on ground or soil. Filter water as necessary to meet local requirements.
   2. Waste water containing asbestos, including drainage from decontamination showers, shall be filtered in accordance with the following requirements prior to introduction into the sanitary sewer system.
      a. Filter water using four in-line filter cartridges with 2" inlets and outlets. The outlet of each filter cartridge shall be connected in series to the inlet of the next cartridge. The first cartridge shall contain 100 µm prefilters and the second and third cartridge shall contain 25 µm filters and the final cartridge shall contain 5 µm filters.
      b. Spare filters of all three sizes shall be maintained at the site at all times to replace prefilters during cleaning.
      c. When the prefilters become clogged, replace with spares, store accumulated debris as contaminated waste receptacles for disposal at an approved facility, and wash out the prefilters in the shower, allowing the drainage from the cleaning operation to go through the filtration system.
      d. Provide a holding tank for contaminated wastewater as required to prevent backup of water into shower when the amount of water generated exceeds the flow rate of the filters.

**END OF SECTION 02 82 00**

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ATTACHMENT A

ASBESTOS COMPLIANCE WORK PLAN OUTLINE

In accordance the City of Berkeley and County of Alameda's Abatement Specifications, the Subcontractor is required to prepare a written (typed or word-processed), site-specific Asbestos Work Plan, and submit to the City prior to start of work. This plan is required for the Subcontractor to meet OSHA requirements as well as the Project Specifications, and shall describe work procedures and control methods that will protect City of Berkeley's facilities and citizens.

*The Subcontractor shall prepare the Asbestos Work Plan to include, at a minimum, the following information:*

I. Location of Work:

The work to be completed under this Asbestos Work Plan will be completed at:
Mental Health Services Center
2640 Martin Luther King Jr. Way
Berkeley, California, 94704

Previous hazardous materials inspections or surveys have found that asbestos-containing materials are present at the following locations:

(list all materials and locations, to assure the City of Berkeley that the Subcontractor is aware of all hazardous materials locations)

The presence of asbestos represents a hazard to workers who may disturb these materials during the course of this work.

II. Description of Work:

Describe the anticipated work scope, including:
A. Removal (list materials and locations)
B. Encapsulation (list materials and locations)
C. Repair (list materials and locations)
D. Decontamination (list materials and locations)
E. Any other activities that will or may result in worker exposures to asbestos.

III. Schedule:

A. General
Start Date:
Completion Date:

The competent person [ ], will conduct worksite visual inspections on a daily basis, or more often as necessary.

B. Phase Dates

| Phase/Task | Anticipated Date(s) |
|---|---|
| Mobilization | |
| Setup of work area(s), containments, other | |
| Removal/repair/other abatement | |
| Final cleaning | |
| Visual Inspection | |
| Final clearance (visual and air sampling) | |
| Teardown | |
| Demobilization | |

IV. Equipment and Materials:

List all equipment and materials to be used, such as the following. List trade names or types where known.

HEPA vacuums
scrapers
power saws
hammers
screwdrivers
pry bars
cutting shears
other hand tools

negative air filtration units
manometers
shower facilities
airless sprayers/compressors
cleaning detergents
solvents (must be approved by City of Berkeley)

paints/sealants/encapsulants (must be approved by City of Berkeley)
rollers/brushes

butyl rubber gloves
disposable coveralls
respiratory protection

cotton work gloves
leather work gloves

V. Crew:

List all workers and supervisors, with emergency contact names and pagers.

Clearly identify the supervisor and competent person who has authority for all safety and health.

VI. Control Measures and Work Procedures:

Describe, in a narrative format, specific work procedures, exposure/contamination controls, and engineering controls. This description should include, but not be limited to, the following types of information:

OSHA Class I, II, III, IV
Negative pressure enclosure
Wet methods
Glovebagging
Respiratory Protection
HEPA vacuums
Containment (polyethylene barriers) without negative pressure
Solvent removal of mastic
Other procedures (list)

VII. Respiratory Protection and Protective Clothing/Personal Protective Equipment:

List all respiratory protection, including types and manufacturers, which are anticipated for this project. Identify the phases of the project for which respirators will be required or likely to be required.

List all personal protective equipment anticipated to be used on the project.

VIII. Decontamination/Hygiene Facilities:

Identify the types and locations of decontamination or hygiene facilities to be used on this project. Specify use of disposable towels, soap, hot and cold water, and other supplies, all to be provided by the Subcontractor.

Specify the required use of the facilities, including use of the facilities prior to eating, drinking, and smoking, and before leaving the project site.

Describe handling or treatment of asbestos-contaminated solid waste and wastewater.

IX. Air Monitoring Data:

Identify general worker air monitoring protocol to be followed on this project, including worker category classifications, frequency of monitoring, anticipated laboratory to be used for sample analysis, and how pumps are calibrated and worn by employees. Identify competent person who will oversee Subcontractor's air monitoring.

X. Worker Training and Qualifications:

Provide the Subcontractor's worker documents as an attachment to the Asbestos Work Plan. Include each worker's current AHERA training records, respiratory protection training and fit-testing certification, and asbestos and respiratory protection medical clearances.

XI. Notification:

Describe all arrangements made on multi-employer work sites to inform affected employers about the asbestos project. Attach copies of any notifications.

XII. Containment Diagram:

Include a diagram (either neatly and legibly hand-drawn, or generated on a word processor or CAD program) of the containment showing the containment perimeter in relation to surrounding areas, locations of negative air machines, direction of air flow, decontamination chamber, bag out area, exhaust points to exterior of building, etc.

XIII. Waste:

Describe how all waste generated on this project will be packaged, labeled, and stored. Describe means for off-site transport, manifest, disposal arrangements for all hazardous waste.

XIV. Preparation of Asbestos Work Plan:

Date Prepared:

Prepared By (signature, name, and title)

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CITY OF BERKELEY

ALAMEDA COUNTY, CALIFORNIA
PROJECT # PRWT 122013, SPECIFICATION # 24-11633-C

# BERKELEY MARINA DOCK REPLACEMENT (D-E) PROJECT, BERKELEY, CA

## TECHNICAL SPECIFICATIONS

ISSUED FOR BID SUBMITTAL

JANUARY 15, 2024

CERTIFICATION PAGE

The various portions of the specifications and other contract documents for "BERKELEY MARINA DOCK REPLACEMENT (D-E)," Project #PRWT 122013 Specification # 24-11633-C, Issued for Bid Technical Specifications, have been prepared under the direction of the following design professionals, licensed in the State of California.

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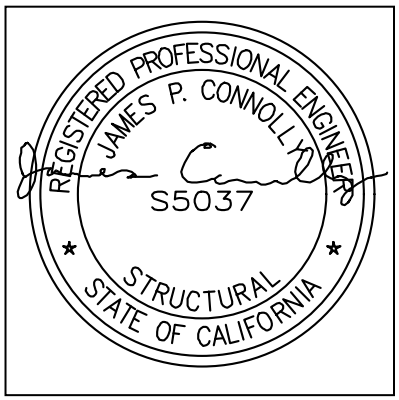


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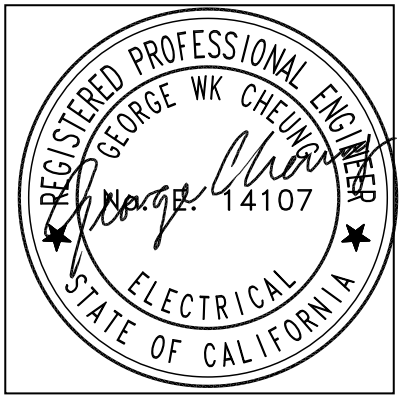


The various portions of the specifications and other contract documents for project "BERKELEY MARINA DOCK REPLACEMENT (D-E)," Project #PRWT 122013, Issued for Bid Specifications are documented in this document.

| Section No. | Section Title | Revision | Source |
|---|---|---|---|
| | **DIVISION 1 - GENERAL REQUIREMENTS** | | |
| | See Division 1 | | |
| | | | |
| | **DIVISION 2 - SITE CONSTRUCTION** | | |
| | | | |
| 02 22 10 | LANDSCAPE SITE SALVAGE | 0 | Design Specification |
| 02 22 50 | STRUCTURE DEMOLITION | 0 | Design Specification |
| | | | |
| | **DIVISION 3 – CONCRETE** | | |
| 03 30 00 | CAST-IN-PLACE CONCRETE | 0 | Design Specification |
| | | | |
| | **DIVISION 5 – METALS** | | |
| 05 50 00 | METAL FABRICATIONS | 0 | Design Specification |
| 05 50 13 | ALUMINUM PIPE AND TUBE | 0 | Design Specification |
| 05 50 13.10 | ALUMINUM GANGWAY | 0 | Design Specification |
| | | | |
| | **DIVISION 6 - WOOD AND PLASTICS** | | |
| 06 13 33 | PRESERVATIVE TREATED LUMBER AND TIMBER | 0 | Design Specification |
| | | | |
| | **DIVISION 10 – SPECIALTIES** | | |
| 10 14 00.10 | EXTERIOR SIGNAGE | 0 | Design Specification |
| | | | |
| | **DIVISION 12 – FURNISHINGS** | | |
| 12 93 00 | SITE FURNISHINGS | 0 | |
| | | | |
| | **DIVISION 21 – FIRE PROTECTION** | | |
| 21 00 00 | FIRE PROTECTION CABINETS | 0 | Design Specification |
| 21 05 29 | HANGERS AND SUPPORTS FOR FIRE-SUPPRESSION PIPING | 0 | Design Specification |
| 21 11 00 | FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING | 0 | Design Specification |
| 21 11 19 | FIRE DEPARTMENT CONNECTIONS | 0 | Design Specification |
| 21 12 00 | FIRE SUPPRESSION STANDPIPES | 0 | Design Specification |
| 21 12 13 | FIRE SUPPRESSION HOSES AND NOZZLES | 0 | Design Specification |
| | | | |
| | **DIVISION 22 – PLUMBING** | | |
| 22 05 16 | EXPANSION FITTINGS FOR PIPPING | 0 | Design Specification |
| 22 05 23.12 | BALL VALVES FOR PLUMBING PIPING | 0 | Design Specification |
| 22 05 29 | HANGERS AND SUPPORTS FOR PLUMBING PIPING | 0 | Design Specification |
| 22 11 16 | DOMESTIC WATER PIPING | 0 | Design Specification |
| | | | |
| | **DIVISION 26 – ELECTRICAL** | | |
| 26 05 19 | LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES | 0 | Design Specification |
| 26 05 26 | GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS | 0 | Design Specification |

| Section No. | Section Title | Revision | Source |
|---|---|---|---|
| 26 05 29 | HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS | 0 | Design Specification |
| 26 05 33 | RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS | 0 | Design Specification |
| 26 05 43 | UNDERGROUND DUCTS AND REACE WAYS FOR ELECTRICAL SYSTEMS | 0 | Design Specification |
| 26 05 53 | IDENTIFICATION FOR ELECTRICAL SYSTEMS | 0 | Design Specification |
| 26 24 13 | SWITCHBOARDS | 0 | Design Specification |
| 26 24 16 | PANEL BOARDS | 0 | Design Specification |
| 26 26 00 | POWER CENTER SUBSTATION | 0 | Design Specification |
| 26 27 26 | WIRING DEVICES | 0 | Design Specification |
| | | | |
| | **DIVISION 31 – EARTHWORK** | | |
| 31 10 00 | SITE CLEARING | | |
| 31 23 19 | DEWATERING | | |
| 31 23 00.20 | EXCAVATION AND FILL | 0 | Design Specification |
| 31 62 13.20 | PRESTRESSED CONCRETE GUIDE PILES | 0 | Design Specification |
| | | | |
| | **DIVISION 32 – EXTERIOR IMPROVEMENTS** | | |
| 32 12 16.16 | ROAD MIX ASPHALT PAVEMENT | 0 | Design Specification |
| | | 0 | Design Specification |
| | **DIVISION 33 – SITE UTILITIES** | | |
| | | | |
| 33 11 16 | WATER UTILITIES PIPPING AND APPURTENANCES | 0 | Design Specification |
| 33 13 00 | PRESSURE PIPPING SYSTEMS | 0 | Design Specification |
| | | | |
| | **DIVISION 35 – WATERWAY AND MARINE CONSTRUCTION** | | |
| 35 31 19.13 | ROCK SLOPE PROTECTION (RIP RAP) | 0 | Design Specification |
| 35 51 13.20 | CONCRETE FLOATING DOCK SYSTEMS | 0 | Design Specification |

# SECTION 02 22 10

# LANDSCAPE SITE SALVAGE

## PART 1 - GENERAL

### 1.01 SCOPE

This section includes specifications for the salvageable items pertaining to The Berkeley Marina Dock Replacement (D&E) Project (Project).

A. Salvage items Includes (but Is Not Necessarily Limited to)
   1. Plaques
   2. Fixtures, Furnishings
   3. Irrigation Components: Valves, Valve Boxes, Controllers, Irrigation Heads
   4. Site Metals: Metal scrap including iron, steel, copper, brass, and aluminum.

B. Salvaged and reused items on the project include:
   1. Restroom East Gate
   2. Fill
   3. Rip-Rap

C. Related Sections:
   1. Section 02 22 50 – Structural Demolition

### 1.02 DEFINITIONS

A. Recycle: Recovery of demolition waste for subsequent off-site processing in preparation for reuse.

B. On-site Reuse: Recovery of demolition waste for subsequent on-site processing in preparation for reuse.

C. Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to City.

### 1.03 MATERIALS OWNERSHIP

A. All items designated to be removed and salvaged are owned by the City of Berkeley. The Engineers are authorized to direct their removal, protection, and offsite delivery.
   1. Coordinate with the City Engineer who will establish special procedures for removal and salvage.

### 1.04 SUBMITTALS

A. Itemized Salvage List:
   1. Contractor shall provide list of items to be removed and salvaged as indicated in the contract drawings and confirmed on-site, including sheet where shown, quantity, and secure location for item to be placed. Provide signed original to City Engineer prior to start of demolition.

B. Schedule of Salvage Activities: Indicate the following:
   1. Detailed sequence of identification and removal work, with starting and ending dates for each activity.
   2. Written description of method of tagging.
   3. Coordination of delivery location for each item by type with Engineer.
   4. Pre-salvage Photographs: Show existing condition of the following items to be salvaged and reused: Restroom facility fence, fill and gate entry signs. Document any damage or irregularities that might be misconstrued as damage caused by removal and salvage operations. Submit before Work begins.

1.05 QUALITY ASSURANCE

A. Standards: Comply with ANSI A10.6 and NFPA 241.

B. Predemolition and Salvage Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Summary of the Work." Review methods and procedures related site demolition and salvage including, but not limited to, the following:
   1. Field identification of items to be salvaged.
   2. Protection of items to be removed and salvaged.
   3. Removal and salvaging of items as designated.
   4. Delivery of salvaged items to offsite location

1.06 PROJECT CONDITION

A. Hazardous Materials: It is not expected that hazardous materials will be encountered in the landscape site Work.

B. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify City. Hazardous materials will be removed by the general contractor as a change order.

## PART 2 - PRODUCTS

2.01 MATERIALS

A. Containers and Packing
   1. Cardboard boxes with over 75% post-consumer recycled contents.
   2. Previously used wooden pallet.
   3. Recycled paper packaging cushioning.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

A. Review Project Record Documents of existing construction provided by the City Engineer. The City does not guarantee that existing conditions are same as those indicated in Project Record Documents.

B. Tag each item (as applicable) to be removed and salvaged. Do not proceed until directed by to City's Representative.
   1. Tags shall be of non-marking material such as cloth, plastic or laminate.

C. Review Project Record Documents of existing construction provided by the City if requested. The City does not guarantee that existing conditions are the same as those indicated in Project Record Documents. Drawings do not exist for all items.

D. Inventory and record the condition of items to be removed and salvaged.

E. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to the Engineer.

F. Verify that hazardous materials have been remediated before proceeding with site demolition operations.

### 3.02 PACKAGING AND PROTECTION

A. Removed and Salvaged Items
   1. Clean salvaged items of dirt and demolition debris and pack or contain items after cleaning.
   2. Clearly attach to each container an itemized list of contents, along with the name of project, contractor, and City of Berkeley
   3. Keep boxes protected and clean and dry.
   4. Alert the City Engineer immediately to arrange for removal. Contractor is responsible for salvaged items until removed from site under the direction of the City.

B. Plaques and Memorials
   1. Provide salvaged items in cardboard boxes. Wrap any item with packaging material as required to minimize damage.

C. Irrigation Components.
   1. Contractor to be responsible for relocating and reinstalling the existing active irrigation system. For additional information of the exiting active irrigation system see Docks B and C As-built drawings dated 2010.
   2. Contractor shall salvage all sprinkler heads, valve boxes, valves, and backflow preventers. Pipe, wire, conduit, joints and miscellaneous

underground irrigation components shall be abandoned in place as directed by the City Engineer.

3. Provide salvaged items in cardboard boxes. Wrap any item with packaging material as required to minimize damage.

D. Recyclable Materials

1. Deposit all recyclable materials in the containers in a clean (no mud, adhesives, solvents, petroleum contamination), debris-free condition per field direction of the Engineer. Do not deposit contaminated materials into the containers until such time as such materials have been cleaned.

3.03 DELIVERY

A. Salvaged items are to be to the City of Berkeley at the location provided by the Engineer.

B. Notify the Engineer at least 72 hours before delivery.

C. Remove all indicated recyclable materials from the work location to approved containers as directed by the City. All materials shall be stockpiled on-site and removed in an efficient operation. Failure to remove recyclable materials will be considered cause for withholding payment and termination of Contract.

## PART 4 – MEASUREMENT AND PAYMENT

Full compensation for Landscape Site Salvage shall be considered as included in the contract lump sum cost for DEMOLITION and no separate payments will be made thereof.

END OF SECTION

# SECTION 02 22 50

# STRUCTURE DEMOLITION

## PART 1 - GENERAL

### 1.01 SCOPE

This Section includes demolition and removal of selected portions of Dock D and E and/or other structures needed for completion of the project.

A. Structures to be demolished consist of but not limited to the following.
   1. Landscaping
   2. Pier Abutment
   3. Pier Timber Deck and Timber Pilings
   4. Gangway
   5. Floating Dock System and Accessories
   6. Float Timber Piles and Precast Piles
   7. Associated Utilities to the Existing Docks
   8. Back Flow Preventer Slab and Accessories
   9. Concrete Pedestrian Pathway as needed for construction of new abutment and retaining wall.
   10. Asphalt Concrete Pavement for Utility Trenching
   11. Removal and Relocation of East Restroom Facility Fence
   12. Removal and Reinstallation of Rip-Rap

### 1.02 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

### 1.03 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each

activity, interruption of utility services, and locations of temporary partitions (if any) and means of egress.

B. Predemolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit to City Representative before Work begins.

C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.04 QUALITY ASSURANCE

A. Demolition Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

1.05 PROJECT CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by City as far as practical.
   1. Before selective demolition, City will remove the following items:
      a. Loose appurtenances and loose stored items.

B. Hazardous Materials: Hazardous materials may be present in the existing utility float pipes.

C. Storage or sale of removed items or materials on-site is not permitted.

**PART 2 - PRODUCTS**

(Not Used)

**PART 3 - EXECUTION**

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict.

E. Engage a professional engineer to survey condition of site to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

G. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

## 3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Arrange to shut off indicated utilities with utility companies.
   2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of the docks.
   3. Cut off pipe or conduit to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

## 3.03 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or

collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.04 POLLUTION CONTROLS

Environmental Protection Plan: The Contractor shall comply with requirements of the San Francisco Bay Regional Water Quality Control Board (RWQCB) by preparing and administering an Environmental Protection Plan for the project. The Environmental Protection Plan shall provide for each phase of Work, a detailed description of methods, equipment, and sequence of operations to be used to prevent release of debris, runoff, or other materials to the Bay. The Environmental Protection Plan shall include provisions for waste storage, collection and removal, and the associated preventive measure proposed to assure that:

A. No construction material, including asphalt, concrete, wood, chemicals or fuels are to be discharged directly or drained indirectly to the bay from the construction, access or staging areas.

B. Construction equipment will be maintained and fueled in areas where accidental spills could not reach the bay. The debris boom area will be cleaned out with the excavator at a minimum of twice a day.

C. As part of the Environmental Protection Plan, the Contractor shall provide a floating debris barrier and absorbent boom and blanket to capture any debris, soil, or oil that could be released from the work area. Discharge of sawdust, wood, and other particulates is to be minimized to the greatest extent practicable. The debris boom shall be deployed and maintained to prevent any floating debris from escaping the work area. The floating debris barrier shall not be removed until a final inspection of the demolition by the City has been made. The absorbent boom and blankets shall be positioned to contain any oil that may be present in soil or groundwater currently contained by the existing seawall, in the event that failure of the seawall or other event causes soil or groundwater to be released. The spill containment and cleanup materials will be maintained on-site through the duration of the Work. Discharge of sawdust, wood, and other particulates is to be minimized to the greatest extent practicable.

3.05 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to

minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. 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.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.

B. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Dock Structures: All docks, floats and appurtenances to be removed as identified in the Contractors approved demolition plan and as required by these specifications. The construction sequence will be submitted by the Contractor for review and approval by the City and based on operational criteria. The City will coordinate with the Contractor to provide as much advance notice to changes in sequence as practical.

D. Utilities and Related Equipment: Existing utilities are to be disconnected seaward of pier and abutment. The existing utilities shall be removed and terminated in a manner conforming to all applicable codes. The Contractor shall provide temporary connections to the existing utilities when required in a manner conforming to all applicable codes.

E. Timber Pile: Timber piles and stubs shall be completely removed and disposed of at Contractor's expense. Breaking off pile at the mud line shall not be allowed. Disposal site for timber piles to be disposed by contractor. Disposal of piles to be disposed to the approved site set by Regulatory Permits.

F. Piling (materials other than timber): Where piles and stubs occur to be removed, all piles shall be completely removed and disposed of at the Contractor's expense. Breaking off pile at the mud line shall not be allowed.

G. Shrub Debris: All shrub debris and rock interferences shall be removed and disposed of by the Contractor at no additional cost to the City.

H. Rip Rap and Rocks: All Rip Rap and rocks interferences shall be removed, stock piled and reused to bring back the shoreline as close to its original gradation or as modified per the plans to accommodate the new gangway.

I. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by City, 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.

3.06 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused or reinstalled, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off City's property and legally dispose of them.

3.07 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

## PART 4 – MEASUREMENT AND PAYMENT

Full compensation for Structural Demolition shall be considered as included in the contract lump sum cost for DEMOLITION and no separate payments will be made thereof.

END OF SECTION

# SECTION 03 30 00

# CAST IN PLACE CONCRETE

## PART 1 - GENERAL

### 1.01 SCOPE

This Section includes the elements of selected portions of Dock D and E and/or other structures requiring cast in place concrete as needed for completion of the project.

A. Furnish and install the following with cast in place concrete:

1. Utility concrete pads
2. Relocated restroom facility fence footing.
3. Bollard footing.
4. Concrete pavement
5. Concrete abutment and abutment wall
6. Other miscellaneous items.

### 1.02 STANDARDS

A. Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:

1. All work shall conform to these Specifications, as well as all applicable codes of governmental agencies having jurisdiction over the work.

2. Applicable ASTM Specifications as they reasonably apply to this work, except for measurement and payment requirements.

3. American Concrete Institute (ACI), current standards.

   a. ACI 301-20 - Specifications for Concrete Construction; American Concrete Institute International; 2020.

   b. ACI 318-19 – Building Code Requirements for Structural Concrete; American Concrete Institute International; 2019.

   c. ACI SP-66 - ACI Detailing Manual; American Concrete Institute International; 2004.

4. Plywood U.S Product Standard

### 1.03 REVIEWS

A. The City Representative shall review all formwork and/or steel reinforcing before any concrete is cast. Any concrete cast without review by the City Representative may result in removal and replacement at the Contractor's own expense.

1.04 TOLERANCES

A. Tolerances for subgrade, subbase and finished grade shall be as specified by the Standard Specifications except that Contractor shall deliver the full aggregate base and concrete thickness shown. No combination of high and low tolerances that compromise the section will be permitted.

B. Concrete Final Finishes: The Contractor shall demonstrate to the satisfaction of the City Representative that he, or his subcontractor, possesses sufficient skills and experience to perform the work.

1.05 QUALITY ASSURANCE

A. Concrete Forms

1. Concrete Forms: Clean concrete forms of all material or other objects considered deleterious to the concrete structure or surface.

2. Design Criteria: Design concrete forms or shoring to meet the requirements of the type of concrete, sequence of placing, schedule and conditions of the Project.

3. For calculating the strength required of forms, 1 cubic foot of standard weight concrete is assumed to weigh 160 pounds.

4. Construct concrete forms of stress-gradable materials. Unless noted otherwise, the maximum allowable design deflection shall be 1/270 of the span.

5. Provide wedges, jacks, or similar devices to ensure uniform take-up or release of the forms. Do not place wedges where they will be subject to undue bearing stress. Cribbing or stacking of blocking will not be allowed.

B. Reinforcing

1. Perform work of this section in accordance with ACI 301.

2. Identification of Reinforcement. The Contractor shall provide documentation with each load of reinforcement shipped to the project to indicate the manufacturer(s) and heat number(s) of all reinforcing bars included in the shipment, including mill certificates pertinent to each heat of reinforcing bars.

(a) Reinforcing bars that are not so identified shall be tested to document compliance with the physical and chemical properties of the applicable

ASTM specification.

3. Welding Qualifications: Welding procedure specifications, welding operators and welders shall be qualified in accordance with AWS D1.1, AWS D1.4, and as appropriate.

   (a) Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

   (b) Welders whose work fails to pass inspection shall be re-qualified before performing additional welding.

4. Testing Service: The Contractor shall engage an approved testing lab to perform all production work tests, and inspections. The Contractor shall engage a testing laboratory to provide required submittal data including strength tests on alternate materials.

   (a) Materials and installed work may require testing and retesting at any time during progress of Work.

5. Special Inspection. Special Inspection is required for the following elements of the work.

   (a) Reinforcing steel placement. The special inspector shall verify the following.

      (i) The reinforcing grade, size, number, location, and bend detailing are as shown on the drawings and are in acceptable condition.

      (ii) All required devices have been properly installed to secure the reinforcement in place during the placement of concrete.

   (b) Installation of mechanical couplers on reinforcing bars. The special inspector shall verify the following:

      (i) The specific manufacturer and model of couplers have been approved for the application by the City Representative.

      (ii) The couplers are installed according to the manufacturer's recommendations.

   (c) Welding of reinforcing steel shall not be permitted.

## 1.06 SUBMITTALS

The following shall be submitted by the Contractor to the City in accordance with the applicable portions of the referenced specifications:

A. Reinforcing Shop Drawings: Comply with requirements of AC1 SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

1. Include special reinforcing required for openings through concrete elements.

2. Prepare shop drawings under seal of a Professional Engineer experienced in design of work of this type and licensed in California.

3. Each sheet of shop drawings submitted shall incorporate a pre-applied stamp for indicating the results of the engineering review.

B. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

C. If applicable, submit product data and ICC-ES reports for the following products:

1. Mechanical couplers.

2. Deformed bar anchors.

D. Reports: Submit certified copies of mill test reports for each type of reinforcing provided to the project, documenting compliance with the applicable ASTM specification, including chemical analysis, tensile tests and bend tests.

E. Concrete

1. The proposed mix design, giving the brand of cement, type, gradations and source of aggregates, water/cement ratio, mix proportions, and unit weight.

2. Manufacturer’s literature for admixtures, embedded items, liquid membrane-form curing compound and non-shrink grout.

3. Certification that materials are in compliance with specification requirements.

4. Method of transporting and placing concrete.

## 1.07 JOB CONDITIONS

A. Weather Limitations: Construct concrete surface course only when atmospheric temperature is above 40 degrees F., when the underlying base is dry, and when weather is not rainy.

B. Grade Control: Establish and maintain the required lines and grades, including cross-slope during construction operations. All concrete shall slope to drain with no ponding of water.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

Forms, Reinforcing and Concrete: Per Specifications. Materials for concrete forms may be new or used. The quality of the materials, not the age or previous usage, will be the determining factor as to their suitability.

### 2.02 FORMS

A. Plywood Forms

1. Framing lumber shall be of standard dimensions and of such quality as to meet the requirements of the stresses applied.

2. Use High Density Overlay, Plywood U.S. Product Standard PS-1, for all exposed concrete forms. The plywood shall be exterior type without splits or knotholes and sanded smooth. The face grain of the plywood shall run perpendicular to the studs or joists. All joints in surfaces of forms used on exposed surfaces shall be vertical or horizontal. Plywood shall not be less than 1/2-inch thick except where curved areas require the use of 1/4-inch thick material. When 1/4-inch-thick material is used, it shall be backed with heavier material.

3. Shiplap, square-edged boards, or tongue-and-groove sheathing may be used for forming unexposed concrete surfaces.

4. Use metal, fiberglass, or other special form lining where indicated on the Drawings.

B. Steel Forms

1. Steel forms to be fabricated at the site and in the shop shall be approved by the City Engineer prior to construction.

C. Miscellaneous Forms:

1. Paper, fiberglass, micarta, asphalt-impregnated fiber, and other miscellaneous form materials shall be approved prior to construction.

### 2.03 REINFORCING

Reinforcing Steel: ASTM A 615/A 615M Grade 60.

1. Deformed billet-steel bars.

2. Epoxy coated in accordance with ASTM A 775/A 775M.

B. Reinforcing Steel: ASTM A 706/A 706M, deformed low-alloy steel bars.

1. Required where indicated on the drawings.

2. May be used at Contractor's option in all other cases.

3. Epoxy coated in accordance with ASTM A 775/A 775M.

C. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type.

D. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage.

2. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI DA4.

d. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI Class 1) or stainless steel (CRS/ Class 2).

E. Mechanical Couplers:

1. Mechanical Couplers shall provide Type 1 splices, unless indicated otherwise on the drawings.

a. Type 1 splices: Couplers shall be capable of developing 125 percent of the specified yield strength of the spliced reinforcing bar.

b. Type 2 splices: Couplers shall be capable of developing 125 percent of the specified yield strength and shall be capable of developing 100 percent of the specified tensile strength of the spliced reinforcing bar.

2. Products.

a. Lenton Taper Threaded Rebar Splices, manufactured by ERICO Products, IAMPO-UES ER-129.

1) Type 1 splices only.

b. HRC 510 Xtender Mechanical Couplers, manufactured by Headed Reinforcement Corp., ESR 2764. (available upon request or at www.icc-esc.org "ICC-ES Evaluation Report ESR-2764)

1) Type 1 or Type 2 splices.

c. Bar-Lock Coupler Systems, manufactured by Dayton Superior Corporation, IAMPO-UES ER-319.

1) "S" Series: Type 1 splices only.

2) "L" Series: Type 1 or Type 2 splices.

F. Deformed Bar Anchors. ASTM A108, flux-filled, cold-worked wire.

1. Nelson Type Deformed Bar Anchor Studs (ICC ESR-2907),

2. Approved equivalent.

G. Epoxy Rebar Coating Touch Up. Two component, 70% solids epoxy coating specifically manufactured to touch up epoxy-coated reinforcing steel.

## 2.04 CONCRETE

A. Cast-in place concrete shall conform to the following:

1. Cement: Type II modified conforming to ASTM C-150.

2. Aggregate: Maximum 3/4 inch size.

3. Compression strength at 28 days to be 5,000 psi minimum. Strength shall be 5,000 psi for any flatwork.

B. Color Admixture:

1. Add Hi-con black at a rate of 1/8 lb. per sack to all exposed concrete.

C. Expansion Joint Filler: Fiber/expansion joint filler by Burke Co. Order #236, conforming to ASTM D-1751.

D. Cleaning Agents: As required.

E. Aggregate Base: Class II per Specifications.

## 2.05 FABRICATION

A. Prefabricated Forms - All prefabricated forms, whether they are part of a patented system or custom-fabricated, shall be approved by the City prior to assembly.

1. Form Liners and Coatings - Line, coat, or treat forms with a suitable bond-breaker to ensure their timely removal with minimum damage to concrete.

Bond-breaker material shall be non-coloring, non-toxic, and biodegradable product. Bond-breaker material shall not leave a film on concrete surface that will prohibit subsequent finishing activities required to attain desired appearance. Petroleum-based products shall not be used to ease release of forms.

2. Form Ties and Accessories - Form ties shall be manufactured items with stress values published. Form ties shall have a premeasured, break-back, weakened area so that ties can be removed within 3/4-inch of concrete surface.

3. Tie rods for use with inserts shall be set back 1-1/2 inches from concrete surface. Tie-rod steel shall have published stress values.

4. Wire ties and wood spacers will not be allowed.

5. Corner brackets, column clamps, and other specialized accessories shall be utilized in accordance with the manufacturer's recommendations.

6. Quick-release mechanisms, wedges, screw jacks, blocking, eccentric toggle levers, or other equipment shall be according to approved Drawings.

B. Reinforcement - Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.

1. Welding of reinforcement is is not permitted.

2. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D 3963.

## PART 3 - EXECUTION

### 3.01 PREPARATION

A. Clear area to be paved of all debris and organic material. Re-compact and re-grade as necessary prior to placement of concrete. Verify that the subgrade and/or aggregate base is properly compacted and at suitable grade.

B. Before beginning paving work and during construction, take all steps necessary for protection of existing improvements. As the concrete is being placed, extreme care shall be taken not to discolor or damage any improvements. If damage occurs, repair same, and if satisfactory repair cannot be made, remove and replace the section as directed.

C. Formwork and Reinforcement:

1. Assure that excavations and formwork are completed.

    a. Set forms to allow for structural camber plus an allowance for shrinkage and settlement. Finished concrete shall conform to lines and grades indicated on Drawings.

    b. Design, erect, shore, brace, and maintain formwork and falsework, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

    c. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance of ACI 117.

    d. Forms for any concrete/grout structure shall be constructed to prevent leaching of wet concrete/grout and intrusion of seawater. Forms shall remain in place until the concrete/grout is cured.

2. Check that reinforcement is secured in.

    a. Place, support and secure reinforcement against displacement. Do not deviate from required position.

    b. Welding of reinforcing is not permitted.

    c. Do not displace or damage vapor barrier.

    d. Accommodate placement of formed openings.

    e. Maintain concrete cover around reinforcing as indicated on Drawings.

3. Verify that expansion joint material, anchors, and other embedded items are secured in position.

## 3.02 INSTALLATION

### A. Form Installation

1. Prior to final setting or placing of reinforcing steel, forms for exposed concrete surfaces shall be treated with a bond-breaker or parting compound. Apply compound at a rate recommended by manufacturer to provide a smooth surface free of dusting action caused by the chemical reaction of the compound.
2. Forms may be set with a slight bevel or draft for easy removal, where approved by the Engineer-of-Record. Use ¾-inch chamfer strips on exposed inside and outside corners. All forms shall be waterproof. Standing water in forms will not be permitted. Clean forms immediately prior to placing of concrete. Forms shall

be high enough to prevent seawater intrusion at high tide. A top lid system can be used.

B. Form Removal

1. Do not remove or release forms without the approval of the Engineer-of-Record.

2. Forms may be removed when concrete has achieved 80 percent of design strength if no loads are to be applied provided that a curing compound is applied immediately. Do not apply the curing compound to a construction joint surface area between footing and column or wall or to any reinforcing steel. Wet-curing may be utilized in lieu of curing compound; however, at no time during removal of forms and subsequent curing period shall surfaces of concrete be allowed to become dry.

3. Do not release forms from under concrete which has been cured at a temperature under 50°F without first determining if concrete has gained adequate strength, without regard to the time element.

C. Finishes

1. Concrete Paving: Provide a rough-textured medium broom finish with strokes perpendicular to direction of travel along walks. Match adjacent walking surfaces.

2. Base for relocated fence: Shall be light broom finish parallel to longest surface direction.

3.03 FIELD QUALTY CONTROL

A. Reinforcement

1. An independent testing agency or City Representative will inspect installed reinforcement for conformance to contract documents before concrete placement.

2. Special Inspection of reinforcing steel shall include the following:

a. Confirm bar size, bends, condition, and placement, and adequacy of tying and support.

b. Confirm mechanical couplers are of approved type and are installed in accordance with manufacturer's recommendations and applicable ICC ER reports.

c. Confirm headed reinforcement are of approved type and are installed in

accordance with manufacturer's recommendations and applicable ICC ER reports.

d. Perform site bend test on 10% on all deformed bar anchors and headed studs, in accordance with AWS D1.1.

3.04 CLEAN UP

Upon completion of the work under this section, remove immediately all surplus materials, rubbish, and equipment associated with or used in the performance of this work.

## PART 4 - MEASUREMENT AND PAYMENT

The Contract LUMP SUM price paid for LANDSIDE MARINA AND APPURTENANCES and for MARINA UTILITY INFRASTRUCTURE shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved in furnishing and installing cast-in-place concrete, complete in place, including concrete footings as needed, as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the engineer.

## PART 5 - PRODUCT DATA SHEETS

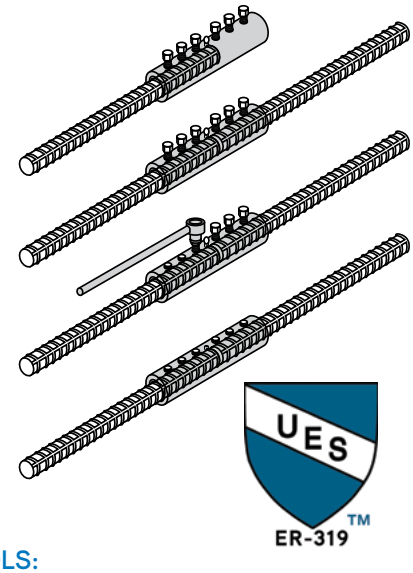
# Bar Lock® S/CA-L & XL Series

## Coupler System

Bar Lock couplers are easy to install and normally do not require any special training or rebar preparation. A typical installation procedure is as follows:

## A. PROCEDURE:

1. Insert end of the first bar halfway into the coupler to the center pin. Hold bar in place and hand-tighten all bolts.
2. Insert end of the second bar halfway into the coupler to the center pin. Hold bar in place and hand-tighten all bolts.
3. In a random alternating pattern, tighten all bolts to approximately 50%.
4. In a random alternating pattern, tighten all bolts to approximately 75%.
5. Tighten all bolts in a random alternating pattern until all bolt heads shear off.




## B. INSTALLATION TOOLS:

A high-quality, 1" - drive pneumatic, impact wrench and towable air compressor are required for sizes #8 thru #18. The requirements for air flow is 100 psig of operating pressure and 185 cfm of delivered air to the impact wrench through a ¾" - 1" air hose. Sizes #4 thru #7 may be installed with smaller impact wrenches.

### IMPORTANT NOTES:

- Prior to bolt tightening, the serrated rails MUST remain aligned in the same position as they were manufactured. If damaged or knocked out of alignment while positioning, installation MUST cease and a new coupler used to replace damaged coupler.
- Bolt tightening MUST be done in a random alternating pattern similar to tightening the lug nuts on an automobile wheel (i.e., 2-4-1-3).
- ***By using the recommended and required tools, installers will see a minimization of installation time and energy. This translates to increased efficiency and cost savings.***

## C. FREQUENTLY ASKED QUESTIONS:

**Specifications and literature are subject to change without notice. Go to www.daytonsuperior.com for the most up-to-date information.**

1. **Approvals:** Bar Lock couplers are test-certified to exceed the requirements of, and are pre-qualified, approved, or recognized by ACI 318, ICC AC-133, Caltrans Service Splice, Ministries of Transportation Canada, IAPMO UES Listed-ER-319, Army Corps of Engineers CW 03219, State DOTs, AASHTO, IBC, and City of Los Angeles.
2. **Center-pin:** Bar Lock couplers are manufactured with a removable center-pin for easy reference to the center of the coupler. As each bar is inserted into the coupler it will butt against the center pin providing the confirmation the rebar is inserted the proper distance within the coupler. The bar ends might not actually butt against one another.
3. **Serrated rails:** The internal grip rails are held into place by a simple "positional weld" only. During bolt tightening it is common this position weld may break loose, but this will not affect performance.
4. Shear bolts: The shearing of the bolt-heads simply confirms adequate torque has been achieved.
5. **Bar-ends:** The rebar may be shear cut, flame cut or sawn and generally require no special bar-end preparation for use with Bar Lock couplers.
6. **Transportation:** Assembled coupler samples must be restricted from rotation when transporting to a testing facility. It is recommended that samples be strapped to a skid lined with damping material like packing or egg crate foam.

## D. EPOXY-COATED REBAR APPLICATIONS

Bar Lock Couplers can be used in conjunction with epoxy-coated rebar. When used with epoxy-coated, Grade 60 rebar, Bar Lock L-Series couplers develop 135% Fy strength and Bar Lock S/CA-Series Couplers develop 125% Fy strength. To achieve the full performance strengths the epoxy must be completely removed from the rebar in the region where the coupler engages the rebar.

## E. LAB TEST GUIDELINES

**Note:** These guidelines address important issues when conducting "in-air" laboratory testing of Bar Lock® rebar couplers. Dayton Superior Bar Lock Couplers are very simple and easy to install and normally do not require any special equipment or operator training. However, since the length of some Bar Lock couplers is often greater than other rebar coupling systems, Dayton Superior recommends certain guidelines for laboratory "in-air" testing. A variation from these guidelines may affect coupler performance and test results.

**Important — Test Machine Grip Clearance:**

An assembled test splice of two rebars joined by any connector may not always achieve exact axial alignment. When the spliced system is placed under high tensile force, this misalignment will create artificial, secondary bending stresses as the spliced system straightens out. However, when the splice is embedded in concrete the tendency for the splice to straighten is restricted by the surrounding concrete. This reduces the secondary bending forces. Consequently, when testing "in-air" in a laboratory without the surrounding concrete, even the slightest misalignment will create secondary bending stresses which will affect tension and slip test readings.

A minimum grip-clear-length for Bar Lock couplers is:

| Size | Grip Clear Length | Each rebar length (min.) | Resulting overall splice length |
|---|---|---|---|
| #3-6 | 12" | 24" | 24"+24"=48" |
| #7-10 | 18" | 30" | 30"+30"=60" |
| #11 | 20" | 36" | 36"+36"=72" |
| #14 | 30" | 48" | 48"+48"=96" |
| #18 | 30" | 54" | 54"+54"=108" |

## D250SCA Bar Lock S/CA-Series Couplers

| Product Code | | Coupler Designation | Bar Size Designation | | | Barrel Stamp Identification | Product Specifications | | | Bolt Specifications | | | Meets or Exceeds | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black | Epoxy | | US | Metric (mm) | CN (M) | | Outside Dia. (in.) | Length (in.) | Weight (lbs.) | Bolt Qty. | Head Size (in.) | Shear Torque (ft. lbs) | Min % Fy* | Caltrans Service | ICC Type 1 |
| 400200 | 400210 | 3 S/CA | #3 | [10] | — | 3S...CA | 1.3 | 3.9 | 1.24 | 4 | 0.5 | 40 | 125 | YES | YES |
| 400200 | 400210 | 4 S/CA | #4 | [13] | [10] | 4S...CA | 1.3 | 3.9 | 1.24 | 4 | 0.5 | 40 | 125 | YES | YES |
| 400201 | 400211 | 5 S/CA | #5 | [16] | [15] | 5S...CA | 1.7 | 4.5 | 2.11 | 4 | 0.5 | 80 | 125 | YES | YES |
| 400202 | 400212 | 6 S/CA | #6 | [19] | [20] | 6S...CA | 1.9 | 6.3 | 3.57 | 6 | 0.5 | 80 | 125 | YES | YES |
| 400203 | 400213 | 7 S/CA | #7 | [22] | — | 7S...CA | 1.9 | 8.0 | 4.30 | 8 | 0.5 | 80 | 125 | YES | YES |
| 400204 | 400214 | 8 S/CA | #8 | [25] | [25] | 8S...CA | 2.4 | 10.2 | 6.10 | 8 | 0.625 | 180 | 125 | YES | YES |
| 400205 | 400215 | 9 S/CA | #9 | [29] | [30] | 9S...CA | 2.9 | 9.0 | 11.88 | 6 | 0.75 | 350 | 125 | YES | YES |
| 400206 | 400216 | 10 S/CA | #10 | [32] | — | 10S...CA | 2.9 | 11.5 | 15.17 | 8 | 0.75 | 415 | 125 | YES | YES |
| 400207 | 400217 | 11 S/CA | #11 | [36] | [35] | 11S...CA | 3.1 | 14.0 | 20.50 | 10 | 0.75 | 415 | 125 | YES | YES |
| 400208 | 400218 | 14 S/CA | #14 | [43] | [45] | 14S...CA | 3.5 | 19.1 | 31.75 | 14 | 0.75 | 475 | 125 | YES | YES |
| 400209 | 400219 | 18 S/CA | #18 | [57] | [55] | 18S...CA | 4.3 | 27.2 | 62.00 | 20 | 0.75 | 475 | 125 | YES | YES |

Note in place of the "...", each Bar Lock Coupler is marked with a tracking code used for full manufacturing traceability.
* When used in conjunction with epoxy-coated Grade 60 rebar, 125% Fy strength is developed.

## D250L Bar Lock L-Series Couplers

| Product Code | | Coupler Designation | Bar Size Designation | | | Barrel Stamp Identification | Product Specifications | | | Bolt Specifications | | | Meets or Exceeds | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black | Epoxy | | US | Metric (mm) | CN (M) | | Outside Dia. (in.) | Length (in.) | Weight (lbs.) | Bolt Qty. | Head Size (in.) | Shear Torque (ft. lbs) | Min % Fu* | Caltrans Service | ICC Type 1 | ICC Type 2 |
| 400327 | 144988 | 3 L | #3 | [10] | — | 3L... | 1.3 | 4.0 | 1.67 | 4 | 0.5 | 40 | 100 | YES | YES | YES |
| 400226 | 400235 | 4 L | #4 | [13] | [10] | 4L... | 1.3 | 5.5 | 1.67 | 6 | 0.5 | 40 | 100 | YES | YES | YES |
| 400227 | 400236 | 5 L | #5 | [16] | [15] | 5L... | 1.7 | 6.3 | 2.90 | 6 | 0.5 | 80 | 100 | YES | YES | YES |
| 400228 | 400237 | 6 L | #6 | [19] | [20] | 6L... | 1.9 | 8.0 | 4.44 | 8 | 0.5 | 80 | 100 | YES | YES | YES |
| 400229 | 400238 | 7 L | #7 | [22] | — | 7L... | 1.9 | 9.8 | 5.10 | 10 | 0.5 | 80 | 100 | YES | YES | YES |
| 400230 | 400239 | 8 L | #8 | [25] | [25] | 8L... | 2.4 | 12.3 | 8.94 | 10 | 0.625 | 180 | 100 | YES | YES | YES |
| 400231 | 400240 | 9 L | #9 | [29] | [30] | 9L... | 2.9 | 11.5 | 15.07 | 8 | 0.75 | 350 | 100 | YES | YES | YES |
| 400232 | 400241 | 10 L | #10 | [32] | — | 10L... | 2.9 | 14.0 | 18.50 | 10 | 0.75 | 415 | 100 | YES | YES | YES |
| 400233 | 400242 | 11 L | #11 | [36] | [35] | 11L... | 3.1 | 16.5 | 23.75 | 12 | 0.75 | 415 | 100 | YES | YES | YES |
| 145831 | 145832 | 14 L | #14 | [43] | [45] | 14L... | 3.5 | 21.58 | 35.14 | 16 | 0.75 | 475 | 100 | YES | YES | YES |
| 142996 | 142996 | 18 L | #18 | [57] | [55] | 18L... | 4.3 | 32.2 | 97.80 | 24 | 0.75 | 475 | 100 | YES | YES | YES |

Note in place of the "...", each Bar Lock Coupler is marked with a tracking code used for full manufacturing traceability.
* When used in conjunction with epoxy-coated Grade 60 rebar, 135% Fy strength is developed.

## D250XL Bar Lock XL-Series Couplers

| Product Code | | | Coupler Designation | Bar Size Designation | | | Barrel Stamp Identification | Product Specifications | | | Bolt Specifications | | | Meets or Exceeds | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black | Epoxy | Galvanized | | US | Metric (mm) | CN (M) | | Outside Diameter (in.) | Length (in.) | Weight (lbs.) | Bolt Qty. | Head Size (in.) | Nominal Shear Torque* | Min % Fu** | CAL TRANS Service | ICC Type 1 | ICC Type 2 |
| 145314 | 145324 | 145147 | 4 XL | #4 | [13] | [10] | 4XL.... | 1.3 | 10.2 | 3.10 | 12 | 0.5 | 40 | 100 | YES | YES | YES |
| 145315 | 145325 | 145148 | 5 XL | #5 | [16] | [15] | 5XL.... | 1.7 | 11.5 | 5.29 | 12 | 0.5 | 80 | 100 | YES | YES | YES |
| 145316 | 145326 | 145149 | 6 XL | #6 | [19] | [20] | 6XL.... | 1.9 | 13.2 | 7.33 | 14 | 0.5 | 80 | 100 | YES | YES | YES |
| 145317 | 145327 | 145150 | 7 XL | #7 | [22] | — | 7XL.... | 1.9 | 15.0 | 7.81 | 16 | 0.5 | 80 | 100 | YES | YES | YES |
| 145318 | 145328 | 145151 | 8 XL | #8 | [25] | [25] | 8XL.... | 2.4 | 18.7 | 13.59 | 16 | 0.625 | 180 | 100 | YES | YES | YES |
| 145319 | 145329 | 145152 | 9 XL | #9 | [29] | [30] | 9XL.... | 2.9 | 19.1 | 25.03 | 14 | 0.75 | 350 | 100 | YES | YES | YES |
| 145320 | 145330 | 145153 | 10 XL | #10 | [32] | — | 10XL.... | 2.9 | 21.6 | 28.54 | 16 | 0.75 | 415 | 100 | YES | YES | YES |
| 145321 | 145331 | 145154 | 11 XL | #11 | [36] | [35] | 11XL.... | 3.1 | 24.1 | 34.69 | 18 | 0.75 | 415 | 100 | YES | YES | YES |
| 145322 | 145332 | 145155 | 14 XL | #14 | [43] | [45] | 14XL.... | 3.5 | 29.1 | 48.14 | 22 | 0.75 | 475 | 100 | YES | YES | YES |
| 145323 | 145333 | 145156 | 18 XL | #18 | [57] | [55] | 18XL.... | 4.3 | 44.8 | 136.06 | 34 | 0.75 | 475 | 100 | YES | YES | YES |

Note in place of the "...", each Bar Lock Coupler is marked with a tracking code used for full manufacturing traceability.
* Foot pounds.
** When used in conjunction with epoxy-coated Grade 75/80 rebar, 135% Fy strength is developed.

## CERTIFICATION:

Bar Lock couplers meet or exceed applicable engineering requirements for tensile and compressive strength when spliced to rebar conforming to ASTM A615 grades 40, 60, 75, and 80; A706 grades 60 and 80. Bar Lock couplers are manufactured from U.S. steel, conforming to ASTM-A-519 specification.

## RETURNS:

Returns must be pre-authorized by Dayton Superior who will issue credit for resalable couplers less an inspection and restocking charge of 25%. All unusable materials (including material of obsolete specifications) will be scrapped and will not be subject to any credit allowance. D ayton Superior will accept for credit only returns made within six months of the original shipment date. Returns must be returned to Dayton Superior Freight Prepaid; Freight Collect shipments will not be accepted. Any specialty orders, obsolete sizes, and non-stock items are not returnable for credit.

## WARRANTY; CLAIMS; EXCLUSIVE REMEDY:

Bar Lock products at the time of shipment are warranted to conform to any applicable written description furnished to buyer by Dayton Superior and to be free from defects in material and workmanship. No other warranty, whether expressed or implied (including any warranty or merchantability of fitness), shall exist in connection with the sale or use of any Bar Lock product. Claims for errors, shortages, defects, or nonconformity's ascertainable upon inspection must be made in writing within 15 days after buyer's receipt of products. All other claims must be made in writing to Dayton Superior within 120 days from date of shipment. P roducts claimed nonconforming or defective must upon Dayton Superior's request be promptly returned to Dayton Superior for inspection. Claims not made as provided above and within the applicable time period may be excluded. Dayton Superior shall in no event be responsible if the products have not been stored or used in accordance with its specifications and recommended procedure. Dayton Superior will, at its option, either repair or replace nonconforming or defective products for which it is responsible or return to buyer their purchase price. The foregoing states buyers exclusive remedy for any breach of Dayton Superior's warranty and for loss or injury caused by the sale or use on any product. Without limiting the generality of the foregoing, Dayton Superior shall in no event be responsible for any loss of business or profits, downtime or delay, labor, repair, or material costs or any similar or dissimilar consequential loss or damage incurred by buyer.

## SHIPMENT, PERFORMANCE, LIMITATIONS OF LIABILITY:

Any specified date or dates are estimates only. Dayton Superior shall have no liability on account of any delay or failure to manufacture, ship, or deliver any products or furnish any service, due directly or indirectly to fire, act of God, accident, illness, labor dispute, material shortage, inadequate transportation, government order, or other similar or dissimilar cause beyond Dayton Superior's reasonable control. Dayton Superior shall in no event be liable for any incidental loss or damage of any kind arising out of any delay or failure to perform, whether or not due to Dayton Superior's negligence or other causes within its control. Without limiting the generality of the foregoing, Dayton Superior shall not be responsible for any loss of business or profits, claims of buyer's customers or other third parties, downtime, delay, labor, repair, or material costs or any similar or dissimilar loss or damage incurred by buyer.

## SHIPPING DAMAGES:

Accept shipment subject to inspection by noting on bill of Lading that "Carton was Broken or Damaged" in transit.

Notify carrier and shipper in writing (listing damaged materials) within 5 days after receipt.

Concealed damages must be reported in writing to the carrier and shipper within 30 days after receipt.

## CORPORATE HEADQUARTERS:

1125 Byers Road
Miamisburg, OH 45342
937-866-0711

## ACCESSORIES AND CHEMICALS:

Customer Service: 888-977-9600
Technical Assistance: 877-266-7732
info@daytonsuperior.com

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**Solon, Ohio 44139**
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michael.ugalde@nvent.com
stanley.johnson@nvent.com

**City of Los Angeles Approval - See Page 30**

# nVent LENTON Mechanical Splice System for Steel Reinforcing Bars in Concrete

**CSI Section:**
**03 21 00 – Reinforced Steel**

## 1.0 RECOGNITION

nVent LENTON Mechanical Splice System recognized in this report has been evaluated for use as mechanical splices for deformed steel reinforcing bars (rebar) in reinforced concrete structural members. The structural properties of the nVent LENTON Mechanical Splice System comply with the intent of the provisions of the following codes and regulations:

- 2018, 2015, 2012, 2009, 2006 and 2003 International Building Code (IBC®)
- 2018, 2015, 2012, 2009, 2006 and 2003 International Residential Code (IRC®)
- Building Code Requirements for Structural Concrete (ACI 318-14, -11, -08, -05, -02)
- 2020 City of Los Angeles Building Code (LABC) – attached Supplement
- 2020 City of Los Angeles Residential Code (LARC) – attached Supplement

## 2.0 LIMITATIONS

Use of the nVent LENTON mechanical couplers recognized in this report is subject to the following limitations:

**2.1** Couplers shall be installed in accordance with the applicable code, the manufacturer's instructions, and this report. Where conflict occur, the more restrictive governs.

**2.2** Splice locations shall comply with applicable code requirements and be noted on plans approved by the building official.

**2.3** Where required, special inspection shall be provided in accordance with Chapter 17 of the IBC®. Duties of the special inspector include verifying:

- Grade and size of rebar.
- Coupler identification.
- Position of the couplers.
- Installation of the couplers to the rebar.

**2.4** The threaded rebar used with nVent LENTON mechanical splice couplers shall be fabricated by nVent or an approved fabricator complying with Section 3.3.1 of this report.

**2.5** Mechanical couplers may be used on epoxy-coated or galvanized bars prior to rebar threading or in a manner as not interfere with proper thread engagement. All threads of the coupler and rebar are to be free of rust, adhered concrete, epoxy and galvanizing coating, and all debris at the time of coupling.

**2.6** Under the 2018 IBC, for structures regulated by Chapter 18 of ACI 318-14 (as required by 2018 IBC Section 1905.1), to splice deformed reinforcing bars resisting earthquake-induced flexure, axial force, or both, in special moment frames, special structural walls, and all components of special structural walls including coupling beams and wall piers, with the nVent LENTON Mechanical Splice Systems, mill certificates of reinforcing bars shall be submitted to the building official as evidence that the steel reinforcing bars comply with ACI 318-14 Section 20.2.2.5.

**2.7** Under the 2015 IBC, for structures regulated by Chapter 18 of ACI 318-14 (as required by 2015 IBC Section 1905.1), to splice deformed reinforcing bars resisting earthquake-induced flexure, axial force, or both, in special moment frames, special structural walls, and all components of special structural walls including coupling beams and wall piers, with the nVent LENTON Mechanical Splice Systems, mill certificates of reinforcing bars shall be submitted to the building official as evidence that the steel reinforcing bars comply with ACI 318-14 Section 20.2.2.5.

**2.8** Under the 2012 IBC, for structures regulated by Chapter 21 of ACI 318-11 (as required by 2012 IBC Section 1905.1), to splice deformed reinforcing bars resisting earthquake-induced flexure, axial force, or both, in special moment frames, special structural walls, and all components of special structural walls including coupling beams and wall piers, with the nVent LENTON Mechanical Splice Systems, mill certificates of reinforcing bars shall be submitted to the building official as evidence that the steel reinforcing bars comply with ACI 318-11 Section 21.1.5.2.

**2.9** Under the 2009 IBC, for structures regulated by Chapter 21 of ACI 318-08 (as required by 2009 IBC Section 1908.1), to splice deformed reinforcing bars resisting earthquake-induced flexural and axial forces in frame members, structural walls and coupling beams, with the nVent LENTON Mechanical Splice Systems, mill certificates of reinforcing bars shall be submitted to the building official as evidence that the steel reinforcing bars comply with ACI 318-08 Section 21.1.5.2.

**2.10** nVent LENTON mechanical couplers recognized in this report are produced in Solon, OH.

**3.0 PRODUCT USE**

**3.1 General: nVent** LENTON mechanical couplers for splicing deformed steel reinforcing bars (rebar) transfer tension and compression forces in reinforced concrete structural members. The nVent LENTON system complies with the requirements of the IBC and ACI 318-14 Sections 25.5.7 and 18.2.7 (ACI 318-11 Sections 12.14.3 and 21.1.6), for use as tension and compression mechanical splices for deformed steel reinforcing bar (rebar). The nVent LENTON system complies with both Type 1 and Type 2 mechanical splice requirements in accordance with ACI 318-14 Section 18.2.7.1 (ACI 318-11 Section 21.1.6.1) as shown in Tables 1 to 19 of this report and consisting of:

- nVent LENTON Standard couplers (A2 & A12), nVent LENTON Standard Transition couplers (A2 & A12), nVent LENTON Form Saver (SA), nVent LENTON Position couplers (P9 & P8) couplers for ASTM A615 Grades 60, 75, and 80 bars; or ASTM A706 Grades 60 and 80 bars.
- nVent LENTON Form Saver (FS) couplers for ASTM A615 Grades 60 and 75 bars; or ASTM A706 Grade 60 bars.
- nVent LENTON Lock (B1) couplers for ASTM A615 Grades 60 and 75 bars; or ASTM A706 Grade 60 bars.
- nVent LENTON Lock (S1) couplers for ASTM A615 Grade 60 or ASTM A706 Grade 60 bars.
- nVent LENTON Interlok (LK) for ASTM A615 Grade 60, 75, and 80 bars; or ASTM A706 Grade 60 and 80 bars.
- nVent LENTON weldable half couplers (C2 & C3J) for ASTM A615 Grade 60 or A706 Grade 60 bars.
- nVent LENTON Ultimate standard couplers (FT12 & MT12), nVent LENTON Ultimate transition couplers (FT12 & MT12), and nVent LENTON Ultimate position couplers (PT15, MS15, & MT12), for ASTM A615 Grades 60, 75, and 80 bars; or ASTM A706 Grades 60 and 80 bars.
- nVent LENTON Connect (B12) couplers for ASTM A615 Grade 60 or ASTM A706 Grade 60 bars.
- nVent LENTON Connect (S2) couplers for ASTM A615 Grade 60 or ASTM A706 Grade 60 bars.

**3.2 Design:** nVent LENTON couplers shall be installed in accordance with the applicable code, this evaluation report, and manufacturer's installation instructions. Where conflicts occur, the more restrictive shall govern. Splice locations shall be detailed on the plans approved by the building official. Minimum concrete cover shall be in accordance with applicable codes and measured from the outer surface of the connecting device or as defined by the registered design professional. Type 2 mechanical splices are permitted in any location within a member as allowed by the IBC, IRC, and ACI 318 in all seismic design categories.

**3.3 Installation:** Installation instructions are supplied with the product and/or are available on the nVent web site (www.erico.com) and as described in Sections 3.4 through 3.16 of this report. Where conflicts occur, the more restrictive shall govern.

**3.3.1** Specially prepared ends of rebar shall be prepared in either the nVent facility or the facility of a fabricator approved by the building official and nVent as required in accordance with 2018 and 2015 IBC Section 1704.2.5.1, 2012 IBC Section 1704.2.5.2, or 2009 IBC Section 1704.2.2. The fabricator shall demonstrate the following items to the satisfaction of the building official for each nVent LENTON coupler series and steel reinforcing bar size:

A) The fabricator prepares the ends of the steel reinforcing bar as required by nVent in a manner consistent with the qualifying test specimens. A description of the method of preparing the rebar ends is found at www.erico.com.

B) For Type 2 splices, connections of each steel reinforcing bar using the fabricator-prepared steel reinforcing bars, tested in static tension, shall develop 100 percent of the specified tensile strength ($f_u$) of the steel reinforcing bar and 125 percent of the specified yield strength ($f_y$) of the reinforcing bar for use under the IBC and IRC. This requirement may be demonstrated in test report(s) submitted to the building official.

C) For Type 1 splices, connections of each steel reinforcing bar using fabricator-prepared steel reinforcing bars, tested in static tension, shall develop at least 125 percent of the specified yield strength ($f_y$) of the steel reinforcing bars. This requirement may be demonstrated in test report(s) submitted to the building official.

**3.4 nVent LENTON Standard Coupler (A2 & A12) (illustrated below)**

nVent LENTON standard coupler is used to connect bars where at least one bar is able to rotate freely. For field installation of the standard coupler, the thread protector is removed from the threaded rebar end, which is inspected for cleanliness and damage. In some cases, the coupler is fastened to the rebar at the fabrication facility to protect the threads. A wired brush should be used to remove rust and adhered concrete from the threads. Coupler is then screwed onto the threaded end of the rebar to be spliced and tightened by hand. The second rebar is then inserted into the coupler and rotated until hand-tight. Connection is then tightened per manufacturer's instructions.

**3.5 nVent LENTON Standard Transition Coupler (A2 & A12) (illustrated below)**

nVent LENTON Standard Transition coupler is similar to the Standard coupler except the coupler is designed to connect rebars of different sizes. Installation for transition couplers is the same as that for standard couplers as described in Section 3.4 of this report.

**3.6 nVent LENTON Form Saver Coupler (SA & FS) (illustrated below)**

nVent LENTON Form Saver coupler is the same in terms of form and function as the standard coupler, except that the SA or FS coupler type has a non-structural form mounting plate attached to the end of the coupler. Mounting plate simply provides a method of securing the SA or FS coupler type and attached bar to form work. An internal thread protector is installed to protect the Form Saver coupler's internal threads. Form Saver FS coupler type is attached to the rebar by a friction forging process, whereby the rebar is attached to the coupler by forcing the components together while the coupler is revolving at a specific rate of speed. The other end of the Form Saver FS coupler type accepts rebar with tapered threads. Unlike the FS coupler type, the Form Saver SA coupler type accepts rebar with tapered threads at each end. As with the FS coupler type, the SA coupler type has a mounting plate that is attached to one end of the coupler. To install the Form Saver (SA or FS) coupler assembly, the mounting plate is used to position and secure the coupler types on the formwork. Upon completion of the concrete pour and removal of the formwork where the SA or FS coupler type is attached, the protectors are removed from both the rebar and the coupler. Taper threaded male rebar of the proper size is then screwed into the exposed end of the Form Saver SA or FS coupler type. Connection is then tightened per manufacturer's instructions. Note: For identification purposes, the face of the Form Saver SA or FS coupler type mounting plate, which is exposed when the formwork is removed, has nVent LENTON coupler bar-size information stamped on the surface.

**3.7 nVent LENTON Position Coupler (P9 & P8) (illustrated below)**

nVent LENTON Position coupler is used to connect curved or bent bars as well as straight bars that shall be held in a predetermined position during the connection process. Coupler may also be used where neither bar is free to rotate. All nVent LENTON Position couplers are manufactured to allow the coupler to rotate. Connection is tightened per manufacturer's instructions. In addition, position couplers are designed to accommodate rebars of different sizes.

**3.8 nVent LENTON Lock Coupler (B1) (illustrated below):**

nVent LENTON Lock coupler is used to connect two bars mechanically. One or both rebars are inserted into the

coupler in a predetermined position and the bolts are tightened in accordance with manufacturer's instructions. As long as the torque values are achieved, the bolt heads are not required to shear off. Unsheared bolt heads may be cut off if concrete cover is an issue. Additional details are found in manufacturer's instructions. In addition to connecting the same bar size to the same bar size, the nVent LENTON Lock coupler may also be used to:

- Connect same size bar to same size bar where both bars are one size smaller than the size identified on the coupler.
- Transition from the bar size identified on the coupler to the next smaller bar size.
- Transition from the bar size identified on the LL25B1 and LL32B1 couplers to two steps smaller bar size.

**3.9 nVent LENTON Lock Coupler (S1) (illustrated below):**

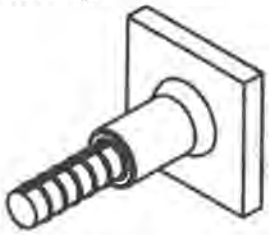
nVent LENTON Lock coupler is used to connect two bars mechanically. One or both rebars are inserted into the coupler in a predetermined position and the bolts are tightened in accordance with the manufacturer's instructions. As long as the torque values are achieved, the bolt heads are not required to shear off. Unsheared bolt heads may be cut off if concrete cover is an issue. Additional details are found in manufacturer's instructions. In addition to connecting the same bar size to the same bar size, the nVent LENTON Lock coupler may also be used to:

- Connect same size bar to same size bar where both bars are one size smaller than the size identified on the coupler, and
- Transition from the bar size identified on the coupler to the next smaller bar size.
- Transition from the bar size identified on the LL25S1 and LL32S1 couplers to two steps smaller bar size.

**3.10 nVent LENTON Interlok (LK) (illustrated below):**

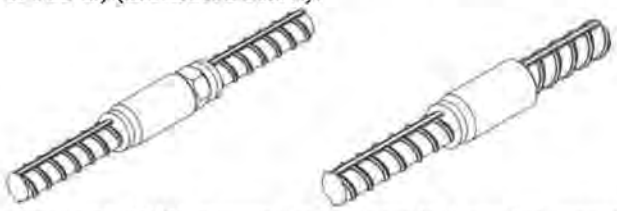
nVent LENTON Interlok coupler is cylindrical, with one end threaded to receive tapered threaded rebar and the opposite end machined with internal annular ridges that are spaced approximately 1 inch (25.4 mm) on center. Interlok coupler shall be installed in accordance with the IBC or IRC, the evaluation report and manufacturer's installation instructions. The system consists of a coupler and grout from nVent. The available grouts are HY10L and HY15LM. The threaded end of the coupler is machined with a LENTON taper thread. A matching nVent LENTON tapered threaded piece of rebar is inserted into this end of the Interlok coupler and rotated until hand-tight. This portion of the connection is then tightened per manufacturer's instructions. The opposite end of the sleeve is open to receive the reinforcing steel of the adjoining precast structural member or projecting dowel. Pouring or pumping grout into the sleeve subsequently completes the connection. Temperatures during grouting shall range between 32°F and 100°F (0°C and 38°C). For HY15LM, additives are available to extend the temperature range down to 20°F and up to 122°F (-7°C to 50°C). Grout shall be mixed with water quantities determined from trial batches in accordance with Section 4.2.2 of this report. All oil, dirt, moisture, and other debris shall be removed from the coupler and other areas to be grouted. Mixed grout shall be either poured or pumped into the Interlok coupler. All spaces within the coupler shall be fully grouted. All spliced joints shall be adequately braced and supported to prevent movement of the rebar within the coupler. Braces are left in place for at least 24 hours, until the grout has attained a minimum compressive strength of 3,000 psi (20.7 MPa). Compression tests consist of 2-inch (51 mm) cubes tested in accordance with ASTM C109.

**3.11 nVent LENTON Weldable Half Coupler (C2 & C3J) (illustrated below):**



nVent LENTON weldable half coupler provides a mechanical means of connecting rebar to structural steel plates and shapes. Coupler is manufactured from weldable grades of material. One end of the coupler is machined with an nVent LENTON taper thread and the opposite side is prepared for welding. Weld shall be designed by a registered design professional in accordance with American Welding Society (AWS) standards. Connection is then tightened per the manufacturer's instructions.

**3.12 nVent LENTON Ultimate Standard Coupler (FT12 & MT12) (illustrated below):**



nVent LENTON Ultimate standard coupler is used to connect bars where at least one bar is able to rotate freely. The coupler consists of two components: female taper threaded (FT12) and male taper threaded (MT12). The FT12 and MT12 components are attached to the connecting rebars by a friction forging process. Alternately, the MT12 component may be substituted by rebar with nVent LENTON tapered threads (illustration shown on the right). One or both connecting bars are rotated until hand-tight. Connection is tightened per manufacturer's instructions. In addition, Ultimate standard couplers are designed to accommodate rebars of different sizes.

**3.13 nVent LENTON Ultimate Transition Coupler (FT12 & MT12) (illustrated below):**

nVent LENTON Ultimate transition coupler is similar to the Ultimate standard coupler except the coupler is designed to connect rebars of different sizes. The MT12 component may be substituted by rebar with nVent LENTON tapered threads (illustration shown on the right). Installation for Ultimate transition couplers is the same as that for Ultimate standard couplers as described in Section 3.12 of this report.

**3.14 nVent LENTON Ultimate Position Coupler (PT15, MS15, & MT12) (illustrated below):**

nVent LENTON Ultimate position coupler is used to connect curved or bent bars as well as straight bars that shall be held in a predetermined position during the connection process. Coupler may also be used where neither bar is free to rotate. Ultimate position couplers are manufactured to allow the coupler to rotate. The length adjustability of the Ultimate position coupler allows significant tolerance for bar gap and positioning during the connection process. The coupler consists of three components: coupler sleeve (PT15), male parallel thread (MS15), and male taper thread (MT12). The MS15 and MT12 components are attached to the connecting rebars by a friction forging process. Alternately, the MT12 component may be substituted by rebar with nVent LENTON tapered threads (illustration shown on the right). Connection is tightened per manufacturer's instructions. In addition, Ultimate position couplers are designed to accommodate rebars of different sizes.

**3.15 nVent LENTON Connect Coupler (B12) (illustrated below):**

nVent LENTON Connect coupler is used to connect two rebars mechanically. One or both rebars are inserted into the coupler in a predetermined position and the bolts are tightened in accordance with the manufacturer's instructions. As long as the torque values are achieved, the bolt heads are not required to shear off. Unsheared bolt heads may be cut off if concrete cover is an issue. Additional details are found in the manufacturer's instructions. In addition to connecting two rebars of the same size, the Connect coupler may also be used to:

- Connect two rebars of the same size where both bars are one size smaller than the size identified on the coupler.

- Transition from one rebar of the bar size identified on the coupler to another rebar of the next smaller bar size.

**3.16 nVent LENTON Connect Coupler (S2) (illustrated below):**

nVent LENTON Connect coupler is used to connect two rebars mechanically. One or both rebars are inserted into the coupler in a predetermined position and the bolts are tightened in accordance with the manufacturer's instructions. As long as the torque values are achieved, the bolt heads are not required to shear off. Unsheared bolt heads may be cut off if concrete cover is an issue. Additional details are found in manufacturer's instructions. In addition to connecting two rebars of the same size, the Connect coupler may also be used to:

- Connect two rebars of the same size where both bars are one size smaller than the size identified on the coupler, and
- Transition from one rebar of the size identified on the coupler to another rebar of next smaller bar size.

## 4.0 PRODUCT DESCRIPTION

### 4.1 General

nVent LENTON system consists of taper threaded rebar splicing and bolted rebar splicing and is designed for use in reinforced concrete construction. nVent LENTON taper threaded system utilizes a 6-degree tapered thread with a varying thread pitch of 1.25 mm, 2.0 mm, or 3.5 mm depending on the reinforcement size. nVent LENTON couplers are available in eleven styles: nVent LENTON Standard (A2 & A12), nVent LENTON Standard Transition (A2 & A12), nVent LENTON Form Saver (SA & FS), nVent LENTON Position (P9 & P8), nVent LENTON Lock (B1 & S1), nVent LENTON Interlok (LK), LENTON weldable half coupler (C2 & C3J), nVent LENTON Ultimate standard (FT12 & MT12), nVent LENTON Ultimate transition (FT12 & MT12), nVent LENTON Ultimate position (PT15, MS15, & MT12), and nVent LENTON Connect (B12 & S2). nVent LENTON couplers are designed to mechanically butt splice No. 4, 0.5-inch-diameter (12 mm) through No. 18, 2.25-inch-diameter (57 mm) deformed reinforcing steel bars.

All grades of rebar may be epoxy coated in accordance with ASTM A775 or A934 when utilizing nVent LENTON taper threaded or bolted couplers. In addition, all grades of rebar may be galvanized in accordance to ASTM A767 when utilizing nVent LENTON taper threaded connections. Coatings complying with ASTM A775, ASTM A934, and ASTM A767 shall be applied prior to rebar threading or in a manner as to not interfere with proper thread engagement.

All coupler styles, excluding the nVent LENTON Lock and Connect coupler types, have interior tapered threads for connecting the reinforcement. For the nVent LENTON threaded coupler types, threads on the rebar or attached components are right-handed and tapered to match the accompanying coupler. Before shipping from the rebar fabrication shop, threaded bar ends shall be protected.

### 4.2 Components

**4.2.1 Couplers:** The couplers' descriptions and illustrations are listed in Tables 1 to 19 of this report.

**4.2.2 Grout:**

**4.2.2.1: nVent LENTON Interlok HY10L Grout:** HY10L grout is a dry, cementitious material, packaged in 50-pound (22.7 kg) bags. Batches of grout shall be mixed in accordance with nVent installation instructions. The amount of water shall be 0.7 to 0.8 gallons (2.7 to 3.0 L) per bag. The correct amount of water to be added to the grout is predetermined by field-testing the flow of trial batches of grout mixtures with a 2-inch-diameter (51 mm), 4-inch-tall (102 mm) cylinder and an nVent LENTON Interlok flow template to obtain a flow of 5 to 6 inches (127 to 152 mm). Where flows exceed 6½ inches (165 mm), the trial batch shall be discarded, and a new trial batch shall be prepared. The minimum compressive strength shall be 8,500 psi (58.6 MPa) at 28 days. Compressive strength tests shall be conducted in accordance with ASTM C942 on 2-inch (51 mm) cube specimens cured at 70°F (21°C). The shelf life of nVent LENTON Interlok HY10L Grout is 12 months from the manufacturing date printed on the bag when stored indoors in a cool, dry environment.

**4.2.2.2 nVent LENTON Interlok HY15LM Grout:** HY15LM grout is a dry, cementitious material, packaged in 50-pound (22.7 kg) bags. Batches of grout shall be mixed in accordance with nVent installation instructions. The amount of water shall be 0.7 to 0.78 gallons (2.7 to 2.95 L) per bag. For optimum pumping conditions, the correct amount of water to be added to the grout is predetermined by field-testing the flow of trial batches of grout mixtures with a 2-inch-diameter (51 mm), 4-inch-tall (102 mm) cylinder and a Interlok flow template. For ease of pumping, the desired flow is 7 to 12 inches (178 to 305 mm). The minimum compressive

strength shall be 7,500 psi (51.7 MPa) for Grade 60 bars or 9,000 psi (62 MPa) for Grade 75 and 80 bars at 28 days. Compressive strength tests shall be conducted in accordance with ASTM C942 on 2-inch (51 mm) cube specimens cured at 70°F (21°C). The shelf life of Interlok HY15LM Grout is 12 months from the manufacturing date printed on the bag when stored indoors in a cool, dry environment.

## 5.0 IDENTIFICATION

All couplers and splices are packaged with a label bearing the manufacturer's name (ERICO International Corporation) or brand name (nVent LENTON), address, model and size, and the IAPMO Uniform ES Mark of Conformity and the Evaluation Report Number (ER-0129) to identify the products recognized in this report. Each nVent LENTON coupler is permanently stamped/labeled with the catalog number, size, heat number, Type 2 designation (except nVent LENTON Lock S1 and nVent LENTON Connect S2), and the name "LENTON."

## 6.0 EVIDENCE SUBMITTED

Data submitted in accordance with the ICC-ES Acceptance Criteria for Mechanical Connector Systems for Steel Reinforcing Bars (AC133), approved October 2015, (editorially revised May 2018). Test reports are from laboratories in compliance with ISO/IEC 17025.

or

**IAPMO UES ER-0129**

## 7.0 STATEMENT OF RECOGNITION:

This report describes the results of research completed by the IAPMO Uniform Evaluation Service on nVent LENTON Mechanical Splice System for Steel Reinforcing Bars in Concrete to assess its conformance to the codes listed in Section 1.0 and serves as documentation of the product certification. The products are manufactured at the location noted in Section 2.10 of this report under a quality control program with periodic inspections under the supervision of IAPMO UES.

**Brian Gerber, P.E., S.E.**
**Vice President, Technical Operations**
**Uniform Evaluation Service**

**Richard Beck, PE, CBO, MCP**
**Vice President, Uniform Evaluation Service**

**GP Russ Chaney**
**CEO, The IAPMO Group**

**For additional information about this evaluation report please visit www.uniform-es.org or email at info@uniform-es.org**

**Table 1: nVent LENTON® System Specification**

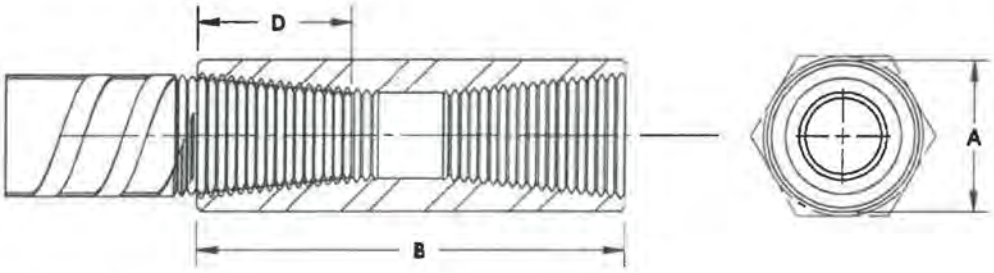
| Series | Part Number Suffix | Material Grade | Rebar Grades | Rebar Sizes | Code Compliance | Section |
|---|---|---|---|---|---|---|
| **nVent LENTON Standard Coupler** | A2, A12 | American Iron and Steel Institute (AISI) 1117/1141 (or equivalent) | ASTM® A706 Grades 60 and 80; A615 Grades 60, 75, and 80 | No. 4 through 18 | IBC®, IRC® **TYPE I + II** | 3.4 |
| **nVent LENTON Standard Transition Coupler** | A2, A12 | AISI 1117/1141 (or equivalent) | ASTM A706 Grades 60 and 80; A615 Grades 60, 75, and 80 | No.4 through 18 | IBC, IRC **TYPE I + II** | 3.5 |
| **nVent LENTON FORM SAVER** | SA | AISI 1117/1141 (or equivalent) | ASTM A706 Grades 60 and 80; A615 Grades 60, 75, and 80 | No.4 through 11 | IBC, IRC **TYPE I + II** | 3.6 |
| | FS | AISI 1117 (or equivalent) | ASTM A706 Grade 60; A615 Grades 60 and 75 | No.4 through 7 | IBC, IRC **TYPE I + II** | |
| **nVent LENTON Position Coupler** | P9, P8 | AISI 1141 (or equivalent) | ASTM A706 Grades 60 and 80; A615 Grades 60, 75, and 80 | No.5 through 18 | IBC, IRC **TYPE I + II** | 3.7 |
| **nVent LENTON Lock** | B1 | AISI 4118/4120 (or equivalent) | ASTM A706 Grade 60; A615 Grades 60 and 75 | No.4 through 18 | IBC, IRC **TYPE I + II** | 3.8 |
| | S1 | AISI 4118/4120 (or equivalent) | ASTM A706 Grade 60 | No.4 through 18 | IBC, IRC **TYPE I + II** | 3.9 |
| | S1 | AISI 4118/4120 (or equivalent) | ASTM A615 Grade 60 | No.4 through 18 | IBC, IRC **TYPE I** | 3.9 |
| **nVent LENTON Interlok** | LK with HY10L | ASTM A536 (or equivalent) | ASTM A706 Grade 60; A615 Grade 60 | No.6 through 14 | IBC, IRC **TYPE I + II** | 3.10 |
| | LK with HY15LM | ASTM A536 (or equivalent) | ASTM A706 Grades 60 and 80; A615 Grades 60, 75, and 80 | No.5 through 18 | IBC, IRC **TYPE I + II** | 3.10 |
| **nVent LENTON Weldable Half Coupler** | C2, C3J | AISI 1018/1030/1035 (or equivalent) | ASTM A706 Grade 60; A615 Grade 60 | No.4 through 18 | IBC, IRC **TYPE I + II** | 3.11 |

**Table 1 Continued**

| Series | Part Number Suffix | Material Grade | Rebar Grades | Rebar Sizes | Code Compliance | Section |
|---|---|---|---|---|---|---|
| **nVent LENTON Ultimate Standard Coupler** | FT12, MT12[1] | AISI 1045 (or equivalent) | ASTM A706 Grades 60 and 80; A615 Grades 60, 75, and 80 | No.4 through 18 | IBC, IRC **TYPE I + II** | 3.12 |
| **nVent LENTON Ultimate Transition Coupler** | FT12, MT12[1] | AISI 1045 (or equivalent) | ASTM A706 Grades 60 and 80; A615 Grades 60, 75, and 80 | No.4 through 18 | IBC, IRC **TYPE I + II** | 3.13 |
| **nVent LENTON Ultimate Position Coupler** | PT15, MS15, MT12[1] | AISI 1045 (or equivalent) | ASTM A706 Grades 60 and 80; A615 Grades 60, 75, and 80 | No.4 through 18 | IBC, IRC **TYPE I + II** | 3.14 |
| **nVent LENTON Connect** | B12 | AISI 1030/1035 (or equivalent) | ASTM A706 Grade 60; A615 Grade 60 | No.4 through 11 | IBC, IRC **TYPE I + II** | 3.15 |
| | S2 | AISI 1030/1035 (or equivalent) | ASTM A706 Grade 60 | No.4 through 11 | IBC, IRC **TYPE I + II** | 3.16 |
| | S2 | AISI 1030/1035 (or equivalent) | ASTM A615 Grade 60 | No.4 through 11 | IBC, IRC **TYPE I** | 3.16 |

[1]Note: MT12 component may be substituted with nVent LENTON taper threaded rebar for IBC, IRC Type I + II.

**nVent LENTON Standard Couplers - A2/A12 Series**




A = Diameter
B = Length of Coupler
D = Bar Engagement

**Table 2: nVent LENTON Standard Couplers – A2 Series**

| Reinforcement Bar Designation | | | | Part Number | "A" | | "B" | | "D" | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | Canadian | Soft Metric | | in | mm | in | mm | in | mm |
| 4 | 12 | 10M | 13 | EL12A2* | 11/16 | 17 | 1-5/8 | 41 | 9/16 | 14 |
| 5 | 16 | 15M | 16 | EL16A2* | 7/8 | 22 | 2-3/16 | 56 | 7/8 | 22 |
| 6 | 20 | 20M | 19 | EL20A2* | 1-1/16 | 27 | 2-13/16 | 71 | 1-1/8 | 29 |
| 7 | 22 | – | 22 | EL22A2* | 1-3/16 | 30 | 3-5/32 | 80 | 1-1/4 | 32 |
| 8 | 25 | 25M | 25 | EL25A2 | 1-3/8 | 35 | 3-11/32 | 85 | 1-3/8 | 35 |
| 9 | 28 | 30M | 29 | EL28A2 | 1-1/2 | 38 | 3-19/32 | 91 | 1-1/2 | 38 |
| 10 | 32 | – | 32 | EL32A2 | 1-3/4 | 44 | 3-25/32 | 96 | 1-9/16 | 40 |
| 11 | 36 | 35M | 36 | EL36A2 | 1-7/8 | 48 | 3-31/32 | 101 | 1-11/16 | 43 |
| – | 38 | – | 38 | EL38A2 | 2 | 51 | 4-1/8 | 105 | 1-3/4 | 44 |
| – | 40 | – | – | EL40A2 | 2-3/16 | 52 | 4-15/16 | 125 | 2-3/16 | 56 |
| 14 | 43 | 45M | 43 | EL43TA2 | 2-1/4 | 57 | 5-1/4 | 133 | 2-1/8 | 56 |
| – | 50 | – | – | EL50TA2 | 2-9/16 | 64 | 6-13/32 | 163 | 2-3/4 | 70 |
| 18 | 57 | 55M | 57 | EL57TA2 | 3 | 76 | 6-1/2 | 164 | 2-3/4 | 71 |

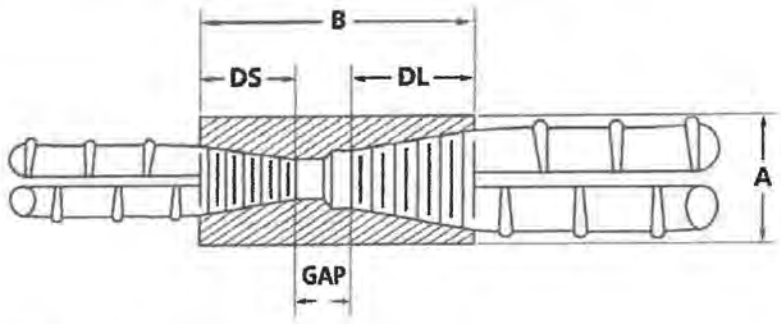
*Uses hexagonal material (measured across the flats); others use round material.

**Table 3: nVent LENTON Standard Couplers – A12 Series**

| Reinforcement Bar Designation | | Part Number | "A" mm | "B" mm | "D" mm |
|---|---|---|---|---|---|
| No. | Metric (mm) | | | | |
| – | 10 | EL10A12* | 17 | 48 | 18 |
| 4 | 12 | EL12A12* | 17 | 49 | 18 |
| – | 14 | EL14A12* | 22 | 55 | 21 |
| 5 | 16 | EL16A12* | 22 | 61 | 24 |
| – | 18 | EL18A12* | 27 | 71 | 29 |
| 6 | 20 | EL20A12* | 27 | 88 | 36 |
| 7 | 22 | EL22A12* | 33 | 91 | 38 |
| 8 | 25 | EL25A12 | 33 | 96 | 41 |
| 9 | 28 | EL28A12 | 37 | 101 | 43 |
| – | 30 | EL30A12 | 37 | 121 | 53 |
| 10 | 32 | EL32A12 | 42 | 107 | 46 |
| – | 34 | EL34A12 | 41 | 128 | 56 |
| 11 | 36 | EL36A12 | 46 | 121 | 53 |
| – | 38 | EL38A12 | 52 | 124 | 54 |
| – | 40 | EL40A12 | 52 | 131 | 58 |
| 14 | 43 | EL43TA12 | 58 | 155 | 68 |
| – | 50 | EL50TA12 | 64 | 163 | 71 |
| 18 | 57 | EL57TA12 | 75 | 189 | 84 |

*Uses hexagonal material (measured across the flats); others use round material.

**nVent LENTON Standard Transition Couplers - A2/A12 Series**




A = Diameter
B = Length of Coupler
DL = Large Bar Engagement
DS = Small Bar Engagement

**Table 4: nVent LENTON Standard Transition Couplers – A2 Series**

| Reinforcement Bar Designation | | Part Number | "A" in | "B" in | "DL" in | "DS" in |
|---|---|---|---|---|---|---|
| No. | Metric (mm) | | | | | |
| 4 to 5 | 12 to 16 | EL1612A2* | 7/8 | 2-5/16 | 7/8 | 9/16 |
| 5 to 6 | 16 to 20 | EL2016A2* | 1-1/16 | 3 | 1-1/8 | 7/8 |
| 6 to 7 | 20 to 22 | EL2220A2* | 1-3/16 | 3-13/32 | 1-1/4 | 1-1/8 |
| 7 to 8 | 22 to 25 | EL2522A2 | 1-3/8 | 3-11/16 | 1-3/8 | 1-1/4 |
| 8 to 9 | 25 to 28 | EL2825A2 | 1-1/2 | 3-29/32 | 1-1/2 | 1-3/8 |
| 9 to 10 | 28 to 32 | EL3228A2 | 1-3/4 | 4-1/8 | 1-9/16 | 1-1/2 |
| 10 to 11 | 32 to 36 | EL3632A2 | 1-7/8 | 4-5/16 | 1-11/16 | 1-9/16 |
| 11 to 14 | 36 to 43 | EL43T36A2 | 2-1/4 | 4-21/32 | 2-1/8 | 1-11/16 |
| 11 to 18 | 36 to 57 | EL57T36A2 | 3 | 5-11/16 | 2-3/4 | 1-11/16 |
| 14 to 18 | 43 to 57 | EL57T43TA2 | 3 | 6-5/16 | 2-3/4 | 2-1/8 |

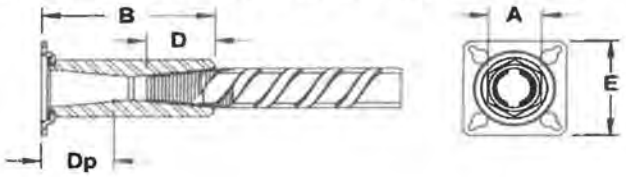
*Uses hexagonal material (measured across the flats); others use round material.

**Table 5: nVent LENTON Standard Transition Couplers – A12 Series**

| Reinforcement Bar Designation | | Part Number | "A" in | "B" in | "DL" in | "DS" in |
|---|---|---|---|---|---|---|
| No. | Metric (mm) | | | | | |
| 4 to 5 | 12 to 16 | EL1612A12* | 7/8 | 2-13/32 | 15/16 | 3/4 |
| 5 to 6 | 16 to 20 | EL2016A12* | 1-1/16 | 3-5/32 | 1-3/8 | 15/16 |
| 6 to 7 | 20 to 22 | EL2220A12* | 1-3/16 | 3-3/4 | 1-7/16 | 1-3/8 |
| 7 to 8 | 22 to 25 | EL2522A12 | 1-3/8 | 3-15/16 | 1-9/16 | 1-7/16 |
| 8 to 9 | 25 to 28 | EL2825A12 | 1-1/2 | 4-1/8 | 1-5/8 | 1-9/16 |
| 9 to 10 | 28 to 32 | EL3228A12 | 1-3/4 | 4-11/32 | 1-3/4 | 1-5/8 |
| 10 to 11 | 32 to 36 | EL3632A12 | 1-7/8 | 4-23/32 | 2-1/16 | 1-3/4 |
| 11 to 14 | 36 to 43 | EL43T36A12 | 2-1/4 | 5-13/16 | 2-5/8 | 2-1/16 |
| 11 to 18 | 36 to 57 | EL57T36A12 | 3 | 6-9/16 | 3-1/8 | 2-1/16 |
| 14 to 18 | 43 to 57 | EL57T43TA12 | 3 | 7-1/4 | 3-1/8 | 2-5/8 |

*Uses hexagonal material (measured across the flats); others use round material.

**nVent LENTON Form Saver Couplers – SA Series**



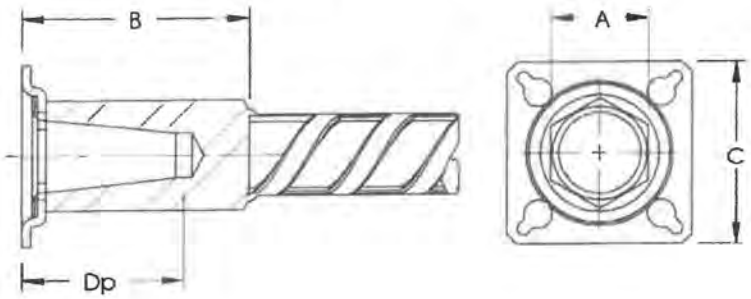

A = Diameter
B = Length of Coupler Body
D = Bar Engagement Non-Mounting Plate Side
Dp = Bar Engagement Mounting Plate Side
E = Length of Mounting Plate

**Table 6: nVent LENTON Form Saver Couplers – SA Series**

| Reinforcement Bar Designation | | Part No. | "A" | | "B" | | "D" | | "Dp" | | "E" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm | in | mm |
| 4 | 12 | EL12SA* | 11/16 | 17 | 1-15/16 | 49 | 9/16 | 14 | 7/8 | 22 | 2-1/4 | 57 |
| 5 | 16 | EL16SA* | 7/8 | 22 | 2-1/2 | 64 | 7/8 | 22 | 1-3/16 | 30 | 2-1/4 | 57 |
| 6 | 20 | EL20SA* | 1-1/16 | 27 | 3-1/8 | 79 | 1-1/8 | 29 | 1-7/16 | 37 | 2-1/4 | 57 |
| 7 | 22 | EL22SA* | 1-3/16 | 30 | 3-15/32 | 88 | 1-1/4 | 32 | 1-9/16 | 40 | 2-1/4 | 57 |
| 8 | 25 | EL25SA | 1-3/8 | 35 | 3-21/32 | 93 | 1-3/8 | 35 | 1-11/16 | 43 | 2-1/4 | 57 |
| 9 | 28 | EL28SA | 1-1/2 | 38 | 3-29/32 | 99 | 1-1/2 | 38 | 1-13/16 | 46 | 2-1/2 | 63 |
| 10 | 32 | EL32SA | 1-3/4 | 44 | 4-3/32 | 104 | 1-9/16 | 40 | 1-7/8 | 48 | 2-1/2 | 63 |
| 11 | 36 | EL36SA | 1-7/8 | 48 | 4-9/32 | 109 | 1-11/16 | 43 | 2 | 51 | 2-1/2 | 63 |

*Uses hexagonal material (measured across the flats); others use round material.

**nVent LENTON Form Saver Couplers – FS Series**



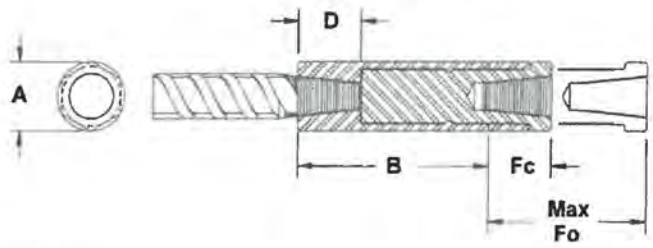

A = Diameter
B = Length of Coupler
C = Length and Width of Mounting Plate
Dp = Bar Engagement

**Table 7: nVent LENTON Form Saver Couplers – FS Series**

| Reinforcement Bar Designation | | Part No. | "A" | | "B" | | "C" | | "Dp" | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm |
| 4 | 12 | ELC12FS2* | 7/8 | 22 | 1-13/16 | 46 | 2-1/4 | 57 | 7/8 | 22 |
| 5 | 16 | ELC16FS2* | 7/8 | 22 | 2-1/16 | 52 | 2-1/4 | 57 | 1-3/16 | 30 |
| 6 | 20 | ELC20FS2* | 1-1/16 | 27 | 2-9/16 | 65 | 2-1/4 | 57 | 1-7/16 | 36 |
| 7 | 22 | ELC22FS2* | 1-3/16 | 30 | 2-13/16 | 71 | 2-1/4 | 57 | 1-9/16 | 39 |

*Uses hexagonal material (measured across the flats); others use round material.

**nVent LENTON Position Couplers – P9 Series**

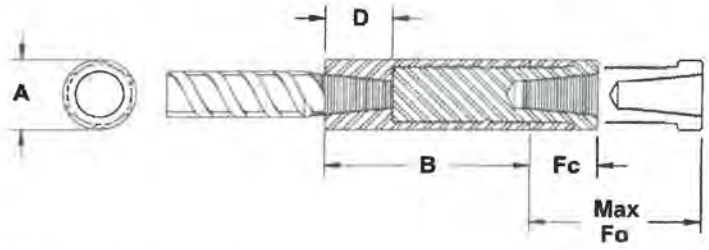



A = Diameter
B = Length of Coupler Body
D = Bar Engagement
Fc = Connector Closed Position
Max. Fo = Connector Fully Open Position

**Table 8: nVent LENTON Position Couplers – P9 Series**

| Reinforcement Bar Designation | | Part No. | "A" | | "B" | | "D" | | "Fc" | | "Max. Fo" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm | in | mm |
| 6 | 20 | EL20P9 | 1-13/16 | 46 | 2-3/4 | 70 | 1-1/8 | 29 | 1-5/8 | 41 | 2-1/8 | 54 |
| 7 | 22 | EL22P9 | 1-13/16 | 46 | 3-1/16 | 78 | 1-1/4 | 32 | 1-5/8 | 41 | 2-1/8 | 54 |
| 8 | 25 | EL25P9 | 1-13/16 | 46 | 3-3/8 | 86 | 1-3/8 | 35 | 1-5/8 | 41 | 2-1/8 | 54 |
| 9 | 28 | EL28P9 | 2-1/2 | 64 | 3-9/16 | 90 | 1-1/2 | 38 | 1-5/8 | 41 | 2-1/8 | 54 |
| 10 | 32 | EL32P9 | 2-1/2 | 64 | 3-13/16 | 97 | 1-9/16 | 40 | 1-5/8 | 41 | 2-1/8 | 54 |
| 11 | 36 | EL36P9 | 2-1/2 | 64 | 4-3/16 | 98 | 1-11/16 | 43 | 1-5/8 | 41 | 2-1/8 | 54 |
| 14 | 43 | EL43TP9 | 3 | 76 | 5 | 127 | 2-1/8 | 54 | 3-13/16 | 97 | 4-5/8 | 117 |
| 18 | 57 | EL57TP9 | 4 | 95 | 6-1/8 | 156 | 2-3/4 | 70 | 4-3/8 | 111 | 5-13/16 | 148 |

**nVent LENTON Position Couplers – P8 Series**

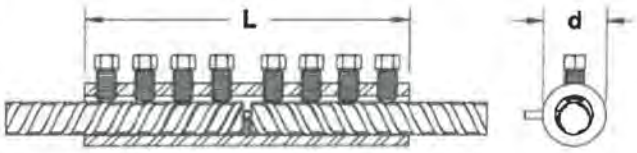



A = Diameter
B = Length of Coupler Body
D = Bar Engagement
Fc = Connector Closed Position
Max. Fo = Connector Fully Open Position

**Table 9: nVent LENTON Position Couplers – P8 Series**

| Reinforcement Bar Designation | | Part No. | "A" | | "B" | | "D" | | "Fc" | | "Max. Fo" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm | in | mm |
| 5 | 16 | EL16P8 | 1-13/16 | 46 | 4-7/16 | 113 | 7/8 | 22 | 1-1/2 | 38 | 2-9/16 | 65 |
| 6 | 20 | EL20P8 | 1-13/16 | 46 | 4-7/16 | 113 | 1-1/8 | 29 | 1-9/16 | 39 | 2-9/16 | 65 |
| 7 | 22 | EL22P8 | 1-13/16 | 46 | 4-15/16 | 125 | 1-1/4 | 32 | 1-1/2 | 38 | 2-3/4 | 70 |
| 8 | 25 | EL25P8 | 1-13/16 | 46 | 5-5/16 | 135 | 1-3/8 | 35 | 1-1/2 | 38 | 2-13/16 | 72 |
| 9 | 28 | EL28P8 | 2-1/2 | 64 | 5-5/8 | 143 | 1-1/2 | 38 | 1-1/2 | 38 | 2-15/16 | 75 |
| 10 | 32 | EL32P8 | 2-1/2 | 64 | 6 | 152 | 1-9/16 | 40 | 1-1/2 | 38 | 3-1/16 | 78 |
| 11 | 36 | EL36P8 | 2-1/2 | 64 | 6-7/16 | 164 | 1-11/16 | 43 | 1-9/16 | 39 | 3-3/8 | 85 |
| 14 | 43 | EL43TP8 | 3 | 76 | 7-13/16 | 198 | 2-1/8 | 54 | 3-19/32 | 92 | 7-5/16 | 186 |
| 18 | 57 | EL57TP8 | 4 | 95 | 9-17/32 | 242 | 2-3/4 | 70 | 4-5/32 | 106 | 8-15/32 | 215 |

**nVent LENTON Lock Couplers – B1 Series**

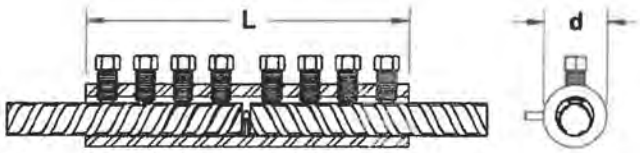



L = Coupler Length
d = Outside Diameter

**Table 10: nVent LENTON Lock Couplers – B1 Series**

| Reinforcement Bar Designation | | Part No | "L" Length | | "d" Outside Diameter | | Inside Diameter | | Number of Bolts |
|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | |
| – | 10 | LL12B1 | 5 | 127 | 1.1 | 29 | 0.6 | 15 | 6 |
| 4 | 12 | LL12B1 | 5 | 127 | 1.1 | 29 | 0.6 | 15 | 6 |
| – | 14 | LL16B1 | 6.3 | 159 | 1.4 | 35 | 0.7 | 19 | 6 |
| 5 | 16 | LL16B1 | 6.3 | 159 | 1.4 | 35 | 0.7 | 19 | 6 |
| – | 18 | LL20B1 | 7.5 | 191 | 1.7 | 44 | 0.9 | 24 | 8 |
| 6 | 20 | LL20B1 | 7.5 | 191 | 1.7 | 44 | 0,9 | 24 | 8 |
| 7 | 22 | LL22B1 | 8.7 | 222 | 1.9 | 48 | 1.1 | 28 | 8 |
| 8 | 25 | LL25B1 | 10 | 254 | 2.1 | 54 | 1.2 | 30 | 8 |
| 9 | 28 | LL28B1 | 11.3 | 287 | 2.4 | 60 | 1.3 | 34 | 10 |
| – | 30 | LL28B1 | 11.3 | 287 | 2.4 | 60 | 1.3 | 34 | 10 |
| 10 | 32 | LL32B1 | 12.7 | 323 | 2.6 | 65 | 1.5 | 38 | 8 |
| – | 34 | LL36B1 | 14.1 | 358 | 2.8 | 72 | 1.7 | 43 | 10 |
| 11 | 36 | LL36B1 | 14.1 | 358 | 2.8 | 72 | 1.7 | 43 | 10 |
| – | 38 | LL40B1 | 15.7 | 400 | 3.1 | 80 | 1.9 | 47 | 12 |
| – | 40 | LL40B1 | 15.7 | 400 | 3.1 | 80 | 1.9 | 47 | 12 |
| 14 | 43 | LL43B1 | 20.6 | 523 | 3.5 | 89 | 2.1 | 53 | 14 |
| – | 50 | LL50B1 | 23.3 | 593 | 4.0 | 102 | 2.4 | 60 | 16 |
| 18 | 57 | LL57B1 | 26.1 | 662 | 4.5 | 117 | 2.6 | 67 | 18 |

**nVent LENTON Lock Couplers – S1 Series**

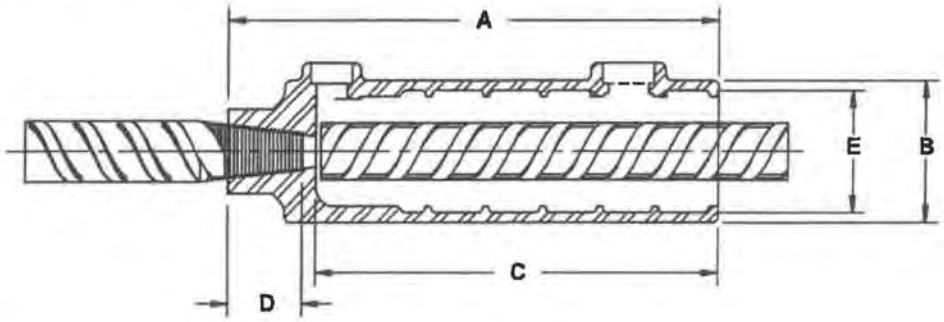



L = Coupler Length
d = Outside Diameter

**Table 11: nVent LENTON Lock Couplers – S1 Series**

| Reinforcement Bar Designation | | Part No | "L" Length | | "d" Outside Diameter | | Inside Diameter | | Number of Bolts |
|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | |
| – | 10 | LL12S1 | 3.9 | 99 | 1.1 | 29 | 0.6 | 15 | 4 |
| 4 | 12 | LL12S1 | 3.9 | 99 | 1.1 | 29 | 0.6 | 15 | 4 |
| – | 14 | LL16S1 | 4.3 | 109 | 1.4 | 35 | 0.7 | 19 | 4 |
| 5 | 16 | LL16S1 | 4.3 | 109 | 1.4 | 35 | 0.7 | 19 | 4 |
| – | 18 | LL20S1 | 6.0 | 153 | 1.7 | 44 | 0.9 | 24 | 6 |
| 6 | 20 | LL20S1 | 6.0 | 153 | 1.7 | 44 | 0,9 | 24 | 6 |
| 7 | 22 | LL22S1 | 6.8 | 173 | 1.9 | 48 | 1.1 | 28 | 6 |
| 8 | 25 | LL25S1 | 6.8 | 173 | 2.1 | 54 | 1.2 | 30 | 6 |
| 9 | 28 | LL28S1 | 6.8 | 173 | 2.4 | 60 | 1.3 | 34 | 6 |
| – | 30 | LL28S1 | 6.8 | 173 | 2.4 | 60 | 1.3 | 34 | 6 |
| 10 | 32 | LL32S1 | 8.7 | 220 | 2.6 | 65 | 1.5 | 38 | 6 |
| – | 34 | LL36S1 | 11.3 | 286 | 2.8 | 72 | 1.7 | 43 | 8 |
| 11 | 36 | LL36S1 | 11.3 | 286 | 2.8 | 72 | 1.7 | 43 | 8 |
| – | 38 | LL40S1 | 13.9 | 352 | 3.1 | 80 | 1.9 | 47 | 10 |
| – | 40 | LL40S1 | 13.9 | 352 | 3.1 | 80 | 1.9 | 47 | 10 |
| 14 | 43 | LL43S1 | 16.5 | 418 | 3.5 | 89 | 2.1 | 53 | 12 |
| -- | 50 | LL57S1 | 22.5 | 572 | 4.5 | 114 | 2.6 | 67 | 14 |
| 18 | 57 | LL57S1 | 22.5 | 572 | 4.5 | 114 | 2.6 | 67 | 14 |

**nVent LENTON Interlok Couplers – LK Series**

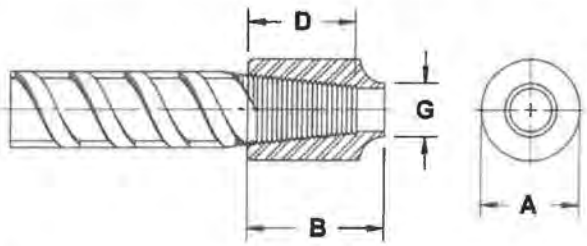



A = Length
B = Outside Diameter
C = Grouted Max. Bar Embedment
D = Threaded Bar Engagement
E = Inside Diameter

**Table 12: nVent LENTON Interlok Couplers – LK Series**

| Reinforcement Bar Designation | | Part No. | "A" | | "B" | | "C" | | "D" | | "E" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm | in | mm |
| 5 | 16 | LK5 | 7.81 | 198.4 | 2.56 | 65.1 | 6.13 | 155.5 | 0.86 | 21.8 | 2.13 | 54 |
| 5 | 16 | LK16 | 7.91 | 200.9 | 2.31 | 58.7 | 6.62 | 168.2 | 1.190 | 30.22 | 1.88 | 47.6 |
| 6 | 20 | LK6 | 7-5/8 | 195 | 2-7/16 | 62 | 6-1/8 | 156 | 1-1/8 | 29 | 1-7/8 | 48 |
| 6 | 20 | LK20 | 8.79 | 223.3 | 2.44 | 61.9 | 7.0 | 177.8 | 1.691 | 42.95 | 2.0 | 50.8 |
| 7 | 22 | LK7 | 7-5/8 | 195 | 2-7/16 | 62 | 6-1/8 | 156 | 1-1/4 | 32 | 1-7/8 | 48 |
| 7 | 22 | LK22 | 8.89 | 225.8 | 2.56 | 65.1 | 7.01 | 178 | 1.784 | 45.32 | 2.13 | 54 |
| 8 | 25 | LK8 | 8-5/8 | 219 | 2-5/8 | 67 | 7 | 178 | 1-3/8 | 35 | 2 | 51 |
| 8 | 25 | LK25 | 8.98 | 228.1 | 2.69 | 68.3 | 7 | 177.8 | 1.884 | 47.86 | 2.25 | 57.2 |
| 9 | 28 | LK9 | 9-3/4 | 248 | 2-3/4 | 70 | 8 | 203 | 1-1/2 | 38 | 2-1/8 | 54 |
| 9 | 28 | LK28 | 10.07 | 255.8 | 2.81 | 71.4 | 8 | 203.2 | 1.970 | 50.04 | 2.38 | 60.3 |
| 10 | 32 | LK10 | 10-13/16 | 275 | 2-15/16 | 75 | 9 | 229 | 1-9/16 | 40 | 2-5/16 | 59 |
| 10 | 32 | LK32 | 11.2 | 284.5 | 3.0 | 76.2 | 9 | 228.6 | 2.100 | 53.34 | 2.56 | 65.1 |
| 11 | 36 | LK11 | 12 | 295 | 3-1/8 | 79 | 9-7/8 | 251 | 1-11/16 | 43 | 2-7/16 | 62 |
| 11 | 36 | LK36 | 12.34 | 313.4 | 3.19 | 81.0 | 9.88 | 251 | 2.364 | 53 | 2.69 | 68.3 |
| – | 40 | LK40 | 15 | 381 | 3-11/16 | 94 | 12-3/4 | 324 | 2-1/8 | 56 | 2-3/4 | 70 |
| 14 | 43 | LKT14 | 15 | 381 | 3-11/16 | 94 | 12-3/4 | 324 | 2-1/8 | 54 | 2-3/4 | 70 |
| 14 | 43 | LKT43 | 15.94 | 404.9 | 3.69 | 93.7 | 12.75 | 323.8 | 3.093 | 60.03 | 3.06 | 77.8 |
| – | 50 | LKT50 | 20-5/16 | 508 | 4-1/2 | 114 | 17 | 432 | 2-3/4 | 71 | 3-1/4 | 83 |
| 18 | 57 | LKT18 | 20-5/16 | 508 | 4-1/2 | 114 | 17 | 432 | 2-3/4 | 72 | 3-1/4 | 83 |
| 18 | 57 | LKT57 | 20.87 | 530.1 | 4.5 | 114.3 | 17 | 432 | 3.767 | 95.69 | 3.56 | 90.5 |

**nVent LENTON Weldable Half Couplers – C2 and C3J Series**

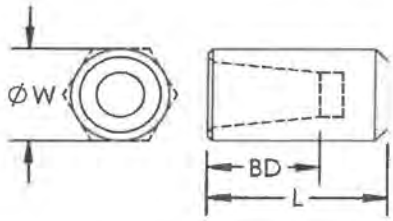



A = Coupler Diameter
B = Length of Coupler
D = Bar Engagement
G = Small Diameter

**Table 13: nVent LENTON Weldable Half Couplers – C2 and C3J Series**

| Reinforcement Bar Designation | | Part No. | "A" | | "B" | | "D" | | "G" | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm |
| 4 | 12 | EL12C2 | ¾ | 19 | 1-3/16 | 30 | 9/16 | 14 | 7/16 | 11 |
| 5 | 16 | EL16C2 | 1 | 25 | 1-3/8 | 35 | 7/8 | 22 | 9/16 | 14 |
| 6 | 20 | EL20C3J | 1-1/4 | 32 | 2-5/32 | 55 | 1-1/8 | 29 | 7/8 | 22 |
| 7 | 22 | EL22C3J | 1-1/4 | 32 | 2-13/32 | 61 | 1-1/4 | 32 | 3/4 | 19 |
| 8 | 25 | EL25C3J | 1-9/16 | 40 | 2-17/32 | 64 | 1-3/8 | 35 | 1 | 25 |
| 9 | 28 | EL28C3J | 1-9/16 | 40 | 2-11/16 | 68 | 1-1/2 | 38 | 15/16 | 24 |
| 10 | 32 | EL32C3J | 2 | 51 | 2-7/8 | 73 | 1-9/16 | 40 | 15/16 | 24 |
| 11 | 36 | EL36C3J | 2 | 51 | 2-31/32 | 75 | 1-11/16 | 43 | 1-1/8 | 29 |
| 14 | 43 | EL43TC3J | 2-3/8 | 60 | 3-3/4 | 96 | 2-1/8 | 54 | 1-13/32 | 36 |
| 18 | 57 | EL57TC3J | 3-1/8 | 79 | 4-1/2 | 114 | 2-3/4 | 71 | 1-3/4 | 44 |

**nVent LENTON Ultimate Standard Couplers – FT12 Series**

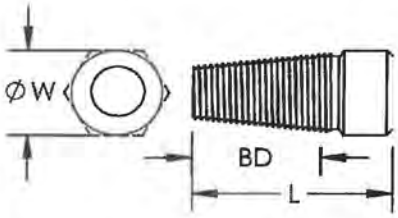



W = Coupler Diameter
L = Length of Coupler
BD = Bar Engagement

**Table 14: nVent LENTON Ultimate Standard Couplers – FT12 Series**

| Reinforcement Bar Designation | | Part No. | "W" Hex | | "W" Round | | "L" | | "BD" | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm |
| 4 | 12 | LU12FT12 | 11/16 | 17 | ---- | ---- | 1-9/16 | 39 | 3/4 | 19 |
| 5 | 16 | LU16FT12 | 7/8 | 22 | ---- | ---- | 1-13/16 | 46 | 1 | 25 |
| 6 | 20 | LU20FT12 | 1-1/16 | 27 | ---- | ---- | 2-15/32 | 63 | 1-7/16 | 36 |
| 7 | 22 | LU22FT12 | 1-3/16 | 30 | ---- | ---- | 2-19/32 | 66 | 1-1/2 | 39 |
| 8 | 25 | LU25FT12 | ---- | ---- | 1-3/8 | 35 | 2-3/4 | 70 | 1-5/8 | 41 |
| 9 | 28 | LU28FT12 | ---- | ---- | 1-1/2 | 38 | 2-7/8 | 73 | 1-11/16 | 43 |
| 10 | 32 | LU32FT12 | ---- | ---- | 1-3/4 | 44 | 3-1/16 | 77 | 1-27/32 | 47 |
| 11 | 36 | LU36FT12 | ---- | ---- | 1-7/8 | 48 | 3-3/8 | 86 | 2-3/32 | 53 |
| 14 | 43 | LU43TFT12 | ---- | ---- | 2-1/4 | 57 | 4-3/8 | 112 | 2-11/16 | 69 |
| 18 | 57 | LU57TFT12 | ---- | ---- | 3 | 76 | 5-1/4 | 133 | 3-3/8 | 86 |

**nVent LENTON Ultimate Standard, Transition, and Position Couplers – MT12 Series**

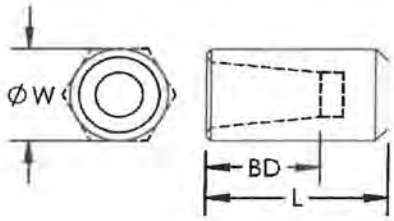



W = Diameter
L = Length of Coupler
BD = Bar Engagement

**Table 15: nVent LENTON Ultimate Standard, Transition, and Position Couplers – MT12 Series**

| Reinforcement Bar Designation | | Part No. | "W" Hex | | "W" Round | | "L" | | "BD" | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm |
| 4 | 12 | LU12MT12 | 11/16 | 17 | ---- | ---- | 1-21/32 | 42 | 3/4 | 19 |
| 5 | 16 | LU16MT12 | 7/8 | 22 | ---- | ---- | 1-29/32 | 48 | 1 | 25 |
| 6 | 20 | LU20MT12 | ---- | ---- | 1-3/8 | 36 | 1-13/32 | 61 | 1-7/16 | 36 |
| 7 | 22 | LU22MT12 | ---- | ---- | 1-3/8 | 36 | 2-21/32 | 68 | 1-1/2 | 39 |
| 8 | 25 | LU25MT12 | ---- | ---- | 1-1/2 | 38 | 2-13/16 | 71 | 1-5/8 | 41 |
| 9 | 28 | LU28MT12 | ---- | ---- | 1-3/4 | 45 | 2-7/8 | 73 | 1-11/16 | 43 |
| 10 | 32 | LU32MT12 | ---- | ---- | 2 | 51 | 3-7/32 | 82 | 1-27/32 | 47 |
| 11 | 36 | LU36MT12 | ---- | ---- | 2-1/4 | 57 | 3-11/32 | 88 | 2-3/32 | 53 |
| 14 | 43 | LU43TMT12 | ---- | ---- | 2-3/4 | 70 | 4-15/32 | 114 | 2-11/16 | 69 |
| 18 | 57 | LU57TMT12 | ---- | ---- | 4 | 102 | 5-13/32 | 137 | 3-3/8 | 86 |

**nVent LENTON Ultimate Transition Couplers – FT12 Series**

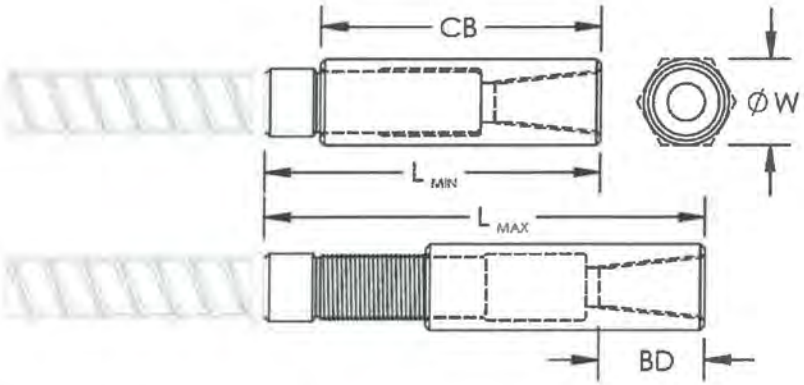



W = Coupler Diameter
L = Length of Coupler
BD = Small Bar Engagement

**Table 16: nVent LENTON Ultimate Transition Couplers – FT12 Series**

| Reinforcement Bar Designation | | Part No. | "W" Hex | | "W" Round | | "L" | | "BD" | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm |
| 4 to 5 | 12 to 16 | LU1612FT12 | 7/8 | 22 | ---- | ---- | 1-13/16 | 46 | 3/4 | 19 |
| 5 to 6 | 16 to 20 | LU2016FT12 | 1-1/16 | 27 | ---- | ---- | 2-15/32 | 63 | 1 | 25 |
| 6 to 7 | 20 to 22 | LU2220FT12 | 1-3/16 | 30 | ---- | ---- | 2-19/32 | 66 | 1-7/16 | 36 |
| 7 to 8 | 22 to 25 | LU2522FT12 | ---- | ---- | 1-3/8 | 35 | 2-3/4 | 70 | 1-1/2 | 39 |
| 8 to 9 | 25 to 28 | LU2825FT12 | ---- | ---- | 1-1/2 | 38 | 2-7/8 | 73 | 1-5/8 | 41 |
| 9 to 10 | 28 to 32 | LU3228FT12 | ---- | ---- | 1-3/4 | 44 | 3-1/16 | 77 | 1-11/16 | 43 |
| 10 to 11 | 32 to 36 | LU3632FT12 | ---- | ---- | 1-7/8 | 48 | 3-3/8 | 86 | 1-27/32 | 47 |
| 11 to 14 | 36 to 43 | LU4336FT12 | ---- | ---- | 2-1/4 | 57 | 4-3/8 | 112 | 2-3/32 | 53 |
| 11 to 18 | 36 to 57 | LU5736FT12 | ---- | ---- | 3 | 76 | 5-1/4 | 133 | 2-3/32 | 53 |
| 14 to 18 | 43 to 57 | LU5743TFT12 | ---- | ---- | 3 | 76 | 5-1/4 | 133 | 2-11/16 | 69 |

**nVent LENTON Ultimate Position Couplers – PT15, MS15 Series**

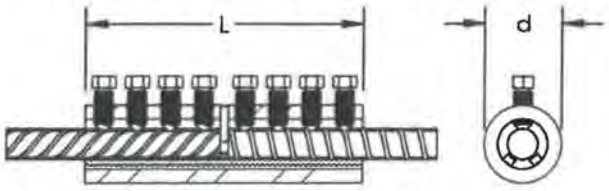



W = Diameter
CB = Length of Coupler Body
BD = Bar Engagement
$L_{MIN}$ = Minimum Length Closed Position
$L_{MAX}$ = Maximum Length Fully Open Position

**Table 17: nVent LENTON Ultimate Position Couplers – PT15, MS15 Series**

| Reinforcement Bar Designation | | Part No. | "W" Hex | | "W" Round | | "CB" | | "BD" | | "$L_{MIN}$" | | "$L_{MAX}$" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm |
| 4 | 12 | LU12PT15 LU12MS15 | 7/8 | 22 | ---- | ---- | 2-17/32 | 64 | 3/4 | 19 | 3-1/4 | 82 | 4-3/16 | 106 |
| 5 | 16 | LU16PT15 LU16MS15 | 1-1/16 | 27 | ---- | ---- | 3-3/32 | 79 | 1 | 25 | 4 | 102 | 5-3/16 | 132 |
| 6 | 20 | LU20PT15 LU20MS15 | ---- | ---- | 1-3/8 | 35 | 4-11/32 | 110 | 1-7/16 | 36 | 5-1/4 | 133 | 6-31/32 | 177 |
| 7 | 22 | LU22PT15 LU22MS15 | ---- | ---- | 1-3/8 | 35 | 4-19/32 | 116 | 1-1/2 | 39 | 5-1/2 | 139 | 7-5/16 | 186 |
| 8 | 25 | LU25PT15 LU25MS15 | ---- | ---- | 1-1/2 | 38 | 4-7/8 | 124 | 1-5/8 | 41 | 6 | 153 | 7-15/16 | 201 |
| 9 | 28 | LU28PT15 LU28MS15 | ---- | ---- | 1-3/4 | 45 | 5-1/8 | 131 | 1-11/16 | 43 | 6-1/2 | 165 | 8-15/32 | 215 |
| 10 | 32 | LU32PT15 LU32MS15 | ---- | ---- | 2 | 51 | 5-17/32 | 140 | 1-27/32 | 47 | 6-7/8 | 174 | 9 | 228 |
| 11 | 36 | LU36PT15 LU36MS15 | ---- | ---- | 2-1/4 | 57 | 6-3/16 | 157 | 2-3/32 | 53 | 7-1/2 | 191 | 9-29/32 | 252 |
| 14 | 43 | LU43TPT15 LU43TMS15 | ---- | ---- | 2-3/4 | 70 | 8-1/16 | 205 | 2-11/16 | 69 | 9-27/32 | 250 | 13-1/16 | 332 |
| 18 | 57 | LU57TPT15 LU57TMS15 | ---- | ---- | 4 | 102 | 10-5/16 | 262 | 3-3/8 | 86 | 12-1/2 | 317 | 16-3/8 | 416 |

**nVent LENTON Connect Couplers – B12 Series**

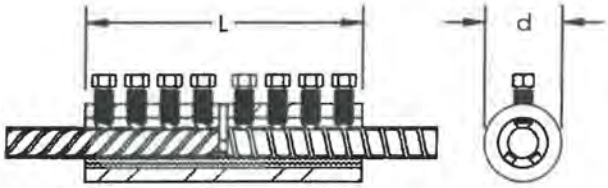



L = Coupler Length
d = Outside Diameter

**Table 18: nVent LENTON Connect Couplers – B12 Series**

| Reinforcement Bar Designation | | Part No. | "L" Length | | "d" Outside Diameter | | Number of Bolts |
|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | |
| 4 | 12 | LC16B12 | 5.1 | 131 | 1.63 | 41.4 | 6 |
| 5 | 16 | LC16B12 | 5.1 | 131 | 1.63 | 41.4 | 6 |
| 6 | 20 | LC20B12 | 6.8 | 172 | 1.90 | 48.3 | 8 |
| 7 | 22 | LC22B12 | 8.7 | 220 | 2.00 | 50.8 | 10 |
| 8 | 25 | LC25B12 | 10.7 | 272 | 2.38 | 60.5 | 10 |
| 9 | 28 | LC28B12 | 11.2 | 284 | 2.80 | 71.1 | 8 |
| 10 | 32 | LC32B12 | 13.7 | 348 | 3.00 | 76.2 | 10 |
| 11 | 36 | LC36B12 | 16.2 | 411 | 3.13 | 79.5 | 12 |

**nVent LENTON Connect Couplers – S2 Series**




L = Coupler Length
d = Outside Diameter

**Table 19: nVent LENTON Connect Couplers – S2 Series**

| Reinforcement Bar Designation | | Part No | "L" Length | | "d" Outside Diameter | | Number of Bolts |
|---|---|---|---|---|---|---|---|
| No. | Metric (mm) | | in | mm | in | mm | |
| 4 | 12 | LC16S2 | 3.5 | 89 | 1.63 | 41.4 | 4 |
| 5 | 16 | LC16S2 | 3.5 | 1.63 | 41.4 | 41.4 | 4 |
| 6 | 20 | LC20S2 | 5.1 | 131 | 1.90 | 48.3 | 6 |
| 7 | 22 | LC22S2 | 6.9 | 174 | 2.00 | 50.8 | 8 |
| 8 | 25 | LC25S2 | 8.7 | 221 | 2.38 | 60.5 | 8 |
| 9 | 28 | LC28S2 | 8.7 | 221 | 2.80 | 71.1 | 6 |
| 10 | 32 | LC32S2 | 11.2 | 284 | 3.00 | 76.2 | 8 |
| 11 | 36 | LC36S2 | 13.7 | 348 | 3.13 | 79.5 | 10 |

# CITY OF LOS ANGELES SUPPLEMENT

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## nVent LENTON Mechanical Splice System for Steel Reinforcing Bars in Concrete:

**CSI Section:**
**03 21 00 Reinforcing Steel**

### 1.0 RECOGNITION

The nVent LENTON Mechanical Splice System for Steel Reinforcing Bars in Concrete described in ER-0129 and this supplemental report have been evaluated for use as mechanical splices for deformed steel reinforcing bars (rebar) in reinforced concrete structural members. The Mechanical Splice System has been evaluated for structural performance properties, subject to the requirements in ER-0129 and this supplemental report. The Mechanical Splice System was evaluated for compliance with the following codes and regulations:

- 2020 City of Los Angeles Building Code (LABC)
- 2020 City of Los Angeles Residential Code (LARC)

### 2.0 LIMITATIONS

Use of the nVent LENTON Mechanical Splice System for Steel Reinforcing Bars in Concrete recognized in this supplement are subject to the following limitations:

**2.1** Continuous special inspections of the Mechanical Splice System during installation shall be provided by Registered Deputy Inspectors as required by Section 1705 of the 2020 LABC, as applicable. The Registered Deputy Inspector shall verify the following: hardware and equipment; cleaning and condition of the bars in accordance with the specifications and the applicable code; and the installation procedures comply with the specifications and the manufacturer's published installation instructions.

**2.2** The fabricator of the steel couplers shall be required to maintain a detailed procedure for material control and suitable procedures and records attesting that the specified coupler has been furnished. The applicable splice designation (Type 1 or Type 2) or coating, as applicable, shall be included in each packaging assembly prior to shipment from the fabricator's plant. The fabricator's identification mark designation shall be established and on record prior to fabrication. Couplers that are not identifiable from marking and test records shall be tested to determine conformity to this report. The fabricator shall furnish an affidavit of compliance and test data shall be provided upon request.

**2.3** The nVent LENTON Mechanical Splice System shall be selected at the jobsite by the Registered Deputy Inspector or by the building inspector and shall be tested by an approved testing agency in accordance with Section 1703 of the LABC. The test shall be conducted on each different rebar size and the frequency of tests shall be as follows: one out of the first ten splices; one out of the next ninety splices; one out of the next one hundred splices. The splice shall develop in tension or compression, as required, at least 125 percent of the specified yield strength of the bar as per Section 25.5.7.1 of ACI 318-14. For Type 2 splices, the splice shall develop at least 100 percent of the specified tensile strength of the steel reinforcing bar.

For Type 2 splices only, if failure of the tested splice should occur prior to obtaining the 125-percent of the specified yield strength and the 100-percent of the specified tensile strength, then 25-percent of all couplers shall be tested for both specified yield strength and specified tensile strength. If failure of the tested Type 2 splice occurs with testing of the 25-percent requirement, as stated above, then all couplers shall be rejected.

**2.4** Minimum concrete cover and spacing between bars or sleeves shall be provided in accordance Section 1808.8.2 of the 2020 LABC.

**2.5** The nVent LENTON Mechanical Splice Systems for Steel Reinforcing Bars in Concrete shall be installed in accordance with the applicable code, manufacturer's installation instructions, and this supplement. A copy of the manufacturer's installation instructions or specifications shall be available on site for all Registered Deputy Inspectors.

**2.6** Splice locations shall be noted on the plans approved by the building official.

**2.7** Installation procedures and specifications for splicing shall only be performed by qualified operators specified by the manufacturer.

END OF SECTION

# SECTION 05 50 00

# METAL FABRICATIONS

## PART 1 - GENERAL

### 1.01 SCOPE

A. Provide and install complete all metal work as shown and specified for the Berkeley Marina Dock Replacement (D&E) Project (Project) including, but not limited to the following:

1. Cleats and inserts
2. Plates
3. Entry Gate & Trellis Bolts
4. Utility bolts inserts
5. Restroom building improvements inserts.

### 1.02 STANDARDS

A. The following codes and standards are hereby made a part of this section and miscellaneous metal work shall conform to the applicable requirements therein except as otherwise specified herein or shown on the drawings. Nothing contained herein shall be construed as permitting work that is contrary to code requirements or governing rules and regulations.

1. Steel Structures Painting Council Surface Preparation Specifications, Vol. 2, Painting Manual.
2. All work shall conform to these Specifications, as well as all applicable codes of governmental agencies having jurisdiction over the work.
3. California Department of Boating and Waterways (DBAW) or City approved codes.
4. American Welding Society (AWS)

### 1.03 SUBMITTALS

A. Shop Drawings: Plates, insert and cleats.

B. Catalog Cuts: Submit for each pre-manufactured item.

C. Welding Qualifications: Submit copy of welder qualification papers to the City Representative for all welders.

1.04 FIELD MEASUREMENTS AND TEMPLATES

A. Field Measurements: The Contractor shall secure field measurements required for adequate fabrication and installation of the Work covered by this Section. Exact measurements are the Contractor's responsibility.

B. Templates: The Contractor shall furnish templates for exact location of anchor bolts and other items to be embedded in concrete, with setting instructions required for installation of embedded items.

1.05 SUBSTITUTIONS

A. Written Acceptance: Specific reference to manufacturer's names and products specified in these sections are used as standards; this implies no right to substitute other materials without written acceptance of the City

B. Contractors' Responsibility: Installation of accepted substitution(s) must be made to the satisfaction of the City Project Manager and without additional cost to the City.

**PART 2 - MATERIALS**

2.01 FASTENINGS

A. Furnish all hardware required for fastenings, as shown on the drawings, and as specified herein, and as required to complete the work. All fasteners shall be hot-dip galvanized unless fastening at aluminum elements or unless coated. Fasteners shall include, but not be limited to, the following:

1. Bolts: Bolts shall be ASTM F 3125 Grade A325 Type 3 or ASTM A 307 Grade A, as shown on the contract drawings, unless noted otherwise.

   The bolt heads and the nuts of the supplied fasteners must be marked with the manufacturer's identification mark, the strength grade and type specified by ASTM specifications.

2. Nuts: Nuts for ASTM A 307 bolts and threaded rods shall be of the same alloy group and the grade and style as recommended in the applicable ASTM standard for the type of bolt being used.

   Nuts for ASTM F3125 Grade A325 bolts shall be heavy hex style grade DH3 or C3.

3. Washers: Use ASTM F 844 flat washers for bolts and threaded rods. Use ASTM

F 436 flat washers for ASTM F3125 GRADE A325 bolts. Unless otherwise specified, all washers shall be of the same alloy group, and shall have a specified minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener.

4. Chains: Stud link chain, Grade 2 or Grade 3 ABS. Chains to be galvanized in accordance with ASTM A123 or ASTM A153 if any.

5. Shackles: Grade 80 screw pin shackles. Shackles galvanized in accordance with ASTM A 123 or ASTM A153 if any.

## 2.02 MATERIALS

A. Steel Fabrications

1. Steel plates, shapes, bars: Conforming to ASTM A36 Grade 36, UNO

2. Concrete inserts: Malleable iron, ASTM A 47, or cast steel, ASTM A 27, inserts, with steel bolts, washers and shims; hot-dip galvanized.

3. Anchors and inserts: Furnish inserts and anchoring devices to be built into other work for installation of miscellaneous metal items. Coordinate delivery to job site to avoid delay. Use non-ferrous metal or hot-dip galvanized anchors and inserts for exterior resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete.

4. Fasteners: Use fasteners made of the same basic metal as the fastened metal, unless otherwise indicated. Do not use metals which are corrosive or incompatible with materials joined. Provide exposed fasteners, if any, which match finish of fastened metal, unless otherwise indicated.

5. Galvanizing repair, if any, shall conform to ASTM A780.

## 2.03 FINISH

A. Structural steel members shall be hot dipped galvanized steel, and as shown on the drawings. All coating damaged during handling shall be recoated in accordance with paint-manufacturers recommendations, at Contractor's expense.

B. All ferrous metal other than stainless steel shall be hot dipped galvanized. Hardware shall be galvanized in accordance with ASTM A153 and shall not be less than two ounces per square foot.

Galvanizing shall be performed before shipment and shall be by a hot dip process conforming to ASTM A123 Grade 100. Galvanizing for steel sheets less than 22 gauge shall conform to ASTM A653 and shall not be less than a total for both sides

of two ounces per square foot. Zinc shall conform to ASTM B695.

Preparation prior to galvanizing shall be by acid pickling. Galvanizing shall be performed the same day as pickling. After pickling and before galvanizing, all items shall be heated to 300 degrees F to expel hydrogen absorbed during pickling.

All cutting, punching, drilling and other machine work shall be performed as far as possible before galvanizing. Should any such work or any welding be necessary after galvanizing, the areas from which galvanizing has been removed shall be touched up in a manner described for repairs.

Components of bolted assemblies shall be galvanized before assembly.

Welded assemblies shall be galvanized after welding.

The zinc coating shall adhere tenaciously to the steel surface, shall be free from blisters and excess zinc, and be even, smooth and uniform throughout.

If necessary, the threads of nuts shall be retapped after galvanizing. Any damaged zinc coatings shall be repaired with galvanizing repair compound.

## PART 3 - EXECUTION

3.01 GENERAL

A. Verify all measurements at site prior to ordering materials.

B. Coordinate all metal work with adjoining work for details of attachment, fitting, etc. Do all cutting, shearing, drilling, punching, threading, tapping, etc., required for miscellaneous metal or for attachment of adjacent work. Drill or punch holes; do not use cutting torch. Shearing and punching shall leave true lines and surfaces.

C. Conceal all fastenings where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Form joints exposed to weather to exclude water.

D. Make all permanent connections in ferrous metal surfaces using welds where at all possible. Do not use bolts or screws where they can be avoided. Re-galvanize all welds made between galvanized metals. Re-coat all welds made between coated metals.

E. Provide all lugs, clips, anchors and miscellaneous fastenings necessary for the complete assembly and installation.

F. Set all work plumb, true, rigid, and neatly trimmed out.

G. Where items must be incorporated or built into adjacent work, deliver to trade

responsible for proper location of such items.

3.02 WELDING

A. Perform all welding in accordance with these Specifications, AWS standards, and industry practices.

B. Welds shall be made only by operators experienced in performing the type of work indicated.

C. Welds normally exposed to view in the finished work shall be uniformly made and shall be ground smooth.

D. Where welding is done in proximity to San Francisco Bay waters, glass, or finished surfaces, such surfaces shall be protected from damage due to welds, sparks, spatter, or tramp metal.

3.03 CLEAN UP

A. Protection and Cleaning: Remove all soiled and foreign matter from finished surfaces and apply such protective measures as required to prevent damage or discoloration of any kind until acceptance of project.

B. During construction, keep premises as clear as possible of materials and debris, and at the completion of work remove all tools, appliances, materials, and debris from the premises.

3.04 Acceptance of Work: Final acceptance of the work will be provided following review by the City Representative.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for Metal Fabrications shall be considered as included in the contract lump sum price for OFFSHORE MARINA AND APPURTENANCES, LANDSIDE MARINA AND APPURTENANCES, MARINA UTILITIES INFRASTRUCTURE, and ACCESSIBILITY IMPROVEMENTS AND LANDSCAPING, and no separate payment will be made thereof.

END OF SECTION

# SECTION 05 50 13

# ALUMINUM PIPE AND TUBE

## PART 1 - GENERAL

### 1.01 SCOPE

A. Provide and install complete all aluminum pipe and tube railings as shown and specified for the Berkeley Marina Dock Replacement (D&E) Project (Project) including, but not limited to, the following: Abutment retaining wall railing extensions, gate extensions and gate frame.

### 1.02 PERFORMANCE REQUIREMENTS

A. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

### 1.03 SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Aluminum material grade
3. Railing brackets.
4. Grout, anchoring cement, and paint products.

B. Construction Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

D. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

## PART 2 - PRODUCTS

### 2.01 METALS, GENERAL

A. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

### 2.02 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

B. Extruded Structural Pipe: ASTM B 429, Alloy 6063-T6.

C. Plate and Sheet: ASTM B 209, Alloy 6061-T6.

D. Castings: ASTM B 26, Alloy A356.0-T6.

### 2.03 MISCELLANEOUS MATERIALS

A. Fasteners: Provide the following:

1. Aluminum Railings and Retractable Ladders: Type 316 stainless-steel fasteners.

B. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

### 2.04 FABRICATION

A. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

B. Form work true to line and level with accurate angles and surfaces.

C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

D. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

E. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

F. Form changes in direction by inserting prefabricated elbow fittings.

G. Bend members in jigs to produce uniform curvature without buckling or otherwise deforming exposed surfaces.

H. Close exposed ends of railing members with prefabricated end fittings.

I. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.

J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers to transfer loads through wall finishes.

## 2.05 ALUMINUM FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: As selected by City.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

C. Anchor posts in concrete by inserting into formed or core-drilled holes and grouting annular space.

### 3.02 CLEANING

A. Remove any surplus railings and accessories from site.

## PART 4 - MEASUREMENT AND PAYMENT

The Contract LUMP SUM price paid for LANDSIDE MARINA AND APPURTENANCES shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved in furnishing and installing aluminum pipe and tubing, complete in place, as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the engineer.

END OF SECTION

# SECTION 05 50 13.10

# ALUMINUM GANGWAY

## PART 1 - GENERAL

1.01 SCOPE

The Work of this section consists of designing, furnishing and installing aluminum gangway and toe plate for the Berkeley Marina Dock Replacement (D&E) Project (Project).

1.02 REFERENCES AND STANDARDS

A. American Welding Society (AWS) D1.2 – 2014 Structural Welding Code – Aluminum.

B. 2005 California Department of Boating and Waterways (DBAW) Layout and Design Guidelines.

C. 2022 California Building Code (CBC) applicable to the land side facility elements only.

D. 2010 ADA Standard for Accessible Design, Section 235 Recreational Boating Facilities, and Section 1003.

1.03 SUBMITTALS

A. Design: The Contractor shall employ the services of a professional Licensed Engineer registered in the State of California to prepare stamped design drawings and calculations for the gangway structures attesting that the gangway, attachment, related components, including handrails, conform to all specifications and regulatory agency requirements.

B. Shop Drawings: Submit Shop Drawings for the complete gangway and handrail assembly, showing all materials, member shapes and sizes, dimensions, quantities, connecting details, accessories and calculations. Shop Drawings shall also be provided for all gate and fence fabrication and all other specially fabricated items and catalog sheets for standard manufactured items.

C. Testing and Inspection Program: Submit a testing and inspection program for all aluminum fabrication welding to assure the welds and fabricated items meet all AWS, CBC and DBAW and other applicable codes and requirements. The cost of the welding testing and inspection shall be borne by the Contractor and no separate

payment will be made by the City for compliance with this requirement.

Submit written copy of Quality Control program prior to fabrication.

D. Certification: Submit certification from manufacturers, suppliers, fabricators, etc., attesting that the following materials conform with the Contract requirements:

1. Aluminum.

2. Fasteners.

3. Certifications of welders.

4. Certification that all aspects of the aluminum ramp/gangway materials, supply, fabrication, testing, inspection and installation meet all specified requirements, codes and standards.

E. Samples: Submit samples for the non-skid decking.

1.04 DESIGN REQUIREMENTS

Information presented in these Specifications is based upon the best estimate of those environmental and physical factors that reasonably can be expected to affect the design, performance and durability of the gangways. These criteria shall be considered as minimum requirements; however, mere conformance to the minimum sizes, strengths and design parameters given herein will not automatically ensure approval. Final calculations shall be the responsibility of the Contractor and shall furnish proof that the gangway structure, using the criteria specified herein as a minimum standard, is designed to withstand the loading without damage throughout the design life of the system. Final design calculations shall be prepared and submitted to the City Representative for review before starting fabrication.

A. Span Length and Width: The clear span length shall be determined based on the specific location and existing site conditions, but shall have a minimum length of 80 feet. The width shall be a minimum of 4 feet (48 inches) clear or 5 ft wide unless otherwise shown on the plans.

B. Vertical Loads: The vertical design load shall be the combination of the dead weight of the structure, including attached utilities and either live load Case A or Case B, whichever governs.

1. Case A shall be a uniformly distributed load of 100 pounds per square foot of deck surface area.

2. Case B shall be a concentrated load of 400 pounds applied on a six (6) inch by six (6) inch area located anywhere on the deck surface.

C. Horizontal Loads: The horizontal design load shall be either a uniformly distributed wind load of seventeen (17) pounds per square foot of profile area, or a seismic load of 0.3 times the dead weight, whichever governs. The horizontal design load shall be applied in combination with the dead weight.

D. Deflection: The maximum deflection under the combination of dead and live loads shall equal the span divided by (360).

E. Safety Factors: The deck and structural components shall be designed with a minimum safety factor on working stress as specified in Aluminum Association - "Specifications for Aluminum Structures" for bridge type structures. For non-aluminum structural components, similar safety factors shall apply.

F. Beam Design: The hollow aluminum box beam may be designed with uniform tapers at each end to conserve materials and improve aesthetics. The depth of beam at the shore hinge shall be such that the bottom of the beam shall clear the seawall (or abutment) at all stages of tide.

In lieu of a box beam design a Warren (vertical support) truss design is acceptable.

G. Skid Resistance: The walking surface shall be provided with an aggressively non-skid surface and shall allow 43% of light to penetrate the deck surface.

H. Handrails: The gangways and fixed ramp shall be fitted with a handrail on each side of the walking surface having the same length as the walking surface. The handrail shall be fabricated of aluminum pipe or tubing with a 1-1/2 inch outside diameter and a smooth gripping surface. Guardrail height shall be forty-two (42) inches from the top of the deck and the spacing of horizontal rails shall be such that a four (4) inch sphere cannot pass through the railing at any point. Handrail extension grab bar shall extend a minimum of 12-inches at either of the gangway.

Guardrail shall be a minimum of 42" in height with a handrail to meet ADA/IBC section 505 between 34" and 38" and CBC chapter 10.

I. Toe Plate: The toe ramp plate shall make a smooth, gap-free transition between the gangway deck and the landing. The ramp plate shall be minimum 1/4 inch material. The ramp will have an aggressive slip resistant surface. The transition plate for all accessible gangways shall be the full width of the gangway deck and have a maximum slope not in excess of one (1) inch in twelve (12) inches at any tide elevation. The lower edge shall be fitted with a continuous UHMW polyethylene wear block of 1/2 inch thick.

J. Wheels and Axle: Wheels or a UHMW sliding mechanism shall be installed at the lower end of the gangway. The wheels shall have an allowable load rating greater than that required by the combination of dead and live loads. Wheels shall be aluminum with a molded on polyurethane tread, minimum 2-1/2 inches wide, and sealed roller bearings. Fabricated nylatron GS wheels that meet above load ratings are also acceptable. Axle shall be stainless steel. The axle shall pass through

"double plates" welded to the frame. Wheels shall be located so that they will be within the wheel guide on the float deck at all stages of tide. If a UHMW sliding mechanism is used, 36" long angle track guides shall be installed as the sliding surface.

K. Wheel Guides and Deck Protective Plates: The landing shall be protected from wear by wheel guides placed under each set of wheels. The wheel guides shall be a minimum of two (2) inches high and of such width and length to underlie the gangway wheels at all stages of tide.

L. Shore Hinge or Transition Plate: The shore hinge shall provide a gap-free walking surface formed by a continuous pipe hinge. Shore hinge plate shall be a minimum 1/2 inch material and shall have two or more 2-1/2 inch diameter by 6 inch long pipe segments welded to mate with the gangway hinge pipe. Hinge pin shall be solid aluminum bar or steel pipe, secured with retainers that are lockable and removable. The gangway box beam shall be beveled at the shore hinge to prevent contact between the beam and the shore hinge supports at all stages of tide. Existing shore hinges may be re-used provided they are inspected; load-tested; and noted as suitable for re-use on the shop drawings.

If transition plate is used it should be minimum ¼" material and have an aggressive slip resistant and metalized surface.

M. Handling and Installation: The gangway design shall include calculation that address loads resulting from handling and installation.

N. Safety and Disability Access: Design shall conform with Disability Access Requirements of Title 24 of the California Administrative Code, and Regulations of California OSHA, City of Berkeley Standard Accessibility Guidelines, California Building Code, Federal ADA Codes and Guidelines, and City of Berkeley requirements where applicable.

O. Compatibility: The design shall be compatible with the existing site access and land side amenities and as approved by the City Representative.

P. Experience of Fabricator: Gangways and fixed ramp shall be fabricated by a firm having a minimum of five (5) years experience in design and fabrication of bridge-type aluminum structures.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Aluminum: All aluminum used in the fabrication shall be Alloy 6061-T6 or 6063-T6. All welding of aluminum shall comply with Aluminum Association - Specifications for Aluminum Structures.

B. Fasteners: All fasteners shall be 316 Series Stainless Steel.

C. Welding Filler Wire: All welds shall be made with a filler metal alloy that will produce a weld that is compatible in corrosion resistance with the base metal.

D. Steel Accessories: All approved mild steel components shall conform to ASTM A-36 and be galvanized after fabrication in accordance with ASTM A-123. All welding of steel shall comply with AWS D 1.1.

E. Non-Skid Surface: Walking surface shall have a permanent aggressively non-skid finish with a minimum of 40% light emitting open area.

F. Dissimilar Materials: Where dissimilar materials are in contact, or where aluminum is in contact with concrete, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, the surfaces shall be protected with a coat of bituminous paint conforming to Federal Specification TT-V-51 to prevent corrosive action.

## PART 3 - EXECUTION

3.01 FABRICATION

A. Workmanship:

All Work shall conform to the reviewed shop drawings, project drawings and this specification. Construction details, finishing details and colors shall be consistent throughout. Work shall be accurately set to establish lines and elevations, and securely fastened in place. Cutting, drilling and punching shall produce clean, true lines and surfaces. Exposed surfaces of work shall have a smooth finish.

B. Welding:

1. Preparation: Parts to be welded shall be free of dirt, grease and other contaminants, and shall fit up properly for sound welding. Surfaces to be welded shall not be cut with oxygen. Sawing, shearing or machining may be used.

2. Welding Procedure: All welding shall be with an inert gas shielded arc process. Machine settings shall be developed by making test welds of the same material alloy and geometry as the work pieces and testing the sample welds destructively. All welds shall be full circumference for either round or square material.

3. Utilities: Utilities (water and electrical) shall be attached to the underside of the gangways by means of "Globe Strut" Aluminum Framing System. Channels shall be welded to the gangway cross-framing on approximately four (4) foot on centers or as noted on drawings. Globe strut channel members shall be Part G 3812 A1 or equal.

All exposed surface of the gangway will be mill finish. Deck shall be sandblasted in accordance with Commercial Sand Blast SSPC-SP 6-63

4. All aluminum gangway welding, welding procedures, testing and inspection shall be done in accordance with the requirements of the Structural Welding Code.

Aluminum ANSI - AWS D1.2
(latest edition)
An American National Standard

The aluminum fabrications in this section shall be subject to testing according to the above specifications. The City Representative has the right to test the gangway or any part of the gangway she/he determines necessary to ensure that it meets the requirements of the specifications.

All welding procedures shall be submitted to the City Representative and approved by him/her in writing prior to use on the gangway. The gangway shall be fabricated only by certified welders, and welder certifications shall be submitted to the City Representative prior to start of fabrication.

All inspection and testing required on the aluminum gangway, the costs of welding procedures and welder certifications will be considered as included in the payment for this item and no additional compensation will be allowed.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for ALUMINUM GANGWAY FABRICATION shall be considered as included in the contract lump sum price for OFFSHORE MARINA AND APPURTENANCES and no separate payment will be made therefor.

END OF SECTION

# SECTION 06 13 33

# PRESERVATIVE TREATED LUMBER AND TIMBER

## PART 1 - GENERAL

### 1.01 SCOPE

This Section includes the installation of the preservative treated lumber and timber of selected portions of Dock D and E and/or other structures needed for completion of the project.

A. Preservative treated lumber and timber consist of but not limited to the following:
   1. Entry gate timber trellis
   2. Float walers
   3. Float rub strips and other miscellaneous components.

### 1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

| | |
|---|---|
| AWPA U1 | (2023) Use Category System: User Specification for Treated Wood |
| AWPA M4 | (2006) Standard for the Care of Preservative-Treated Wood Products |
| AWPA M6 | (2018) Brands Used on Forest Products |

ASTM INTERNATIONAL (ASTM)

| | |
|---|---|
| ASTM A 123/A 123M | (2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products |
| ASTM A 153/A 153M | (2016a) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware |

| | |
|---|---|
| ASTM A 307 | (2021) Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength |

U.S. DEPARTMENT OF DEFENSE (DOD)

| | |
|---|---|
| MIL-P-21035 | (RevB; Notice 2) Paint, High Zinc Dust Content, Galvanizing Repair (Metric) |
| MIL-PRF-907 | (Rev F) Antiseize Thread Compound, High Temperature |

1.03 SUBMITTALS

Contractor shall provide the following submittals to the City Representative. The following shall be submitted:

A. Certificates

- MSDS and CIS
- Preservative Treatment

1.04 DELIVERY AND STORAGE

Close stack treated timber and lumber material in a manner that will prevent long timbers from sagging or becoming crooked. Keep ground under and within 5 feet of such piles free of weeds, rubbish, and combustible materials. Protect materials from weather. Handle treated timber with ropes or chain slings without dropping, breaking outer fibers, bruising, or penetrating surface with tools. Do not use cant dogs, peaveys, hooks, or pike poles. Protect timber and hardware from damage.

1.05 QUALITY ASSURANCE

A. MSDS and CIS

Provide Material Safety Data Sheets (MSDS) and Consumer Information Sheets (CIS) associated with timber preservative treatment. Contractor shall comply with all safety precautions indicated on MSDS and CIS.

**PART 2 - PRODUCTS**

2.01 MATERIALS

A. Lumber and Timbers

1. Solid Sawn

   Provide solid sawn timbers of Douglas Fir-Larch, graded No. 1 or better, and identified by the grade mark of a recognized association or independent inspection agency using the specific grading requirements of an association recognized as covering the species used. The association or independent inspection agency shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used.

2. Preservative Treatment

   Fabricate timbers before preservative treatment. Each piece of treated timber shall be branded, by the producer, in accordance with AWPA M6. Treat wood to be used in contact with saltwater splash in accordance with AWPA U1 with water-borne preservative. Use ACQ (Alkaline Copper Quaternary) with a minimum retention of 0.6 Lbs. per cubic foot or approved equal. The Contractor shall be responsible for the quality of treated wood products.

B. Hardware

Bolts with necessary nuts and washers, timber connectors, drift pins, dowels, nails, screws, spikes, and other fastenings. Bolts and nuts shall conform to ASTM A 307. Provide cast-iron ogee, malleable iron washers, or plate or cut washers where indicated. Provide bolts with washers under nut and head. Provide timber connectors and other metal fastenings of type and correct size shown. Hot-dip galvanize hardware.

C. Zinc-Coating

Galvanize steel specified or indicated by the hot-dip process in accordance with ASTM A 123/A 123M or ASTM A 153/A 153M, as applicable.

D. Antiseize Compound

MIL-PRF-907.

E. Fasteners

Fasteners shall be of the following:

1. Hot dip galvanized conforming to ASTM A153
2. Stainless Steel

## PART 3 - EXECUTION

3.01 CONSTRUCTION

Cut, bevel, and face timbers prior to plant preservative treatment. In addition to the contract clause entitled "Accident Prevention" provide protective equipment for personnel fabricating, field treating, or handling materials treated with water-borne salts. Refer to paragraph 1.05, Quality Assurance.

A. Framing

Cut and frame lumber and timber so that joints will fit over contact surface. Secure timbers and post in alignment. Open joints are unacceptable. Shimming is not allowed. Bore holes for timber spikes with a bit size as recommended by the spike manufacturer. Bore holes for bolts with a bit 1/16 inch larger in diameter than rod or bolt. Counterbore for countersinking wherever smooth faces are indicated or specified.

B. Fastening

Vertical bolts shall have nuts on the lower end. Where bolts are used to fasten timber to timber, timber to concrete, or timber to steel, bolt members together when they are installed and retighten immediately prior to final acceptance of contract. Provide bolts having sufficient additional threading to provide at least 3/8 inch per foot thickness of timber for future retightening.

3.02 FIELD TREATMENT

A. Timberwork

Field treat cuts, bevels, notches, refacing and abrasions made in the field in treated lumber or timbers in accordance with AWPA M4, MSDS and CIS. Wood preservatives are restricted use pesticides and shall be applied according to applicable standards. Trim cuts and abrasions before field treatment. Paint depressions or openings around bolt holes, joints, or gaps including recesses formed by counterboring, with preservative treatment used for lumber or timber; and after bolt is in place, fill with hot pitch or a bitumastic compound.

B. Galvanized Surfaces

Repair and recoat zinc coating which has been field or shop cut, burned by welding, abraded, or otherwise damaged to such an extent as to expose the base metal. Thoroughly clean the damaged area by wire brushing and remove traces of welding flux and loose or cracked zinc coating prior to painting. Paint cleaned area with two coats of zinc oxide-zinc dust paint conforming to MIL-P-21035. Compound paint with a suitable vehicle in a ratio of one part zinc oxide to four parts zinc dust by weight.

C. Antiseize Compound

Coat threads of bolts prior to applying washers and nuts. Recoat bolt thread projection beyond nut after tightening.

## PART 4 - MEASUREMENT AND PAYMENT

The Contract LUMP SUM price paid for OFFSHORE MARINA AND APPURTENANCES and for LANDSIDE MARINA AND APPURTENANCES shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved in furnishing and installing preservative treated lumber and timber, complete in place, as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the engineer.

END OF SECTION

# SECTION 10 14 00.10

# EXTERIOR SIGNAGE

## PART 1-GENERAL

### 1.01 SCOPE

A. Provide and install complete all metal work as shown and specified for the Berkeley Marina Dock Replacement (D&E) Project (Project) including, but not limited to, the following:
   1. Gate D and E sign on gate
   2. Slip signs
   3. Pile warning signs
   4. Accessible slip sign
   5. Fire clearance signs
   6. Other miscellaneous signs per City request

B. Unless specifically noted otherwise, Contractor shall provide and pay for all labor, materials, equipment, tools, transportation, shipping, delivery, taxes, insurance, permits, government fees, licenses, inspections and all other facilities and services necessary for the proper execution and installation of the Work.

### 1.02 QUALIFICATION

A. Fabricator Qualification Requirements: Signage fabricator shall demonstrate a minimum of five years of fabrication experience, and shall have the broad knowledge, diverse shop and field experience, flexibility, coordinating ability, skilled craftsmen and physical plant necessary to produce quality signs equivalent to or better than those specified. Submit qualifying data to the City for approval, including portfolio of previous work showing at least five relevant examples.

### 1.03 REFERENCES

A. Published specifications, standards, tests or recommended methods of trade, industry or governmental organizations apply to work of this Section where cited by abbreviations noted below. Work shall adhere to the most restrictive code.
   1. California Building Code Standard (CBC).
   2. State of California, California Code of Regulations, Title 24 (CCR Title 24)
   3. American Society for Testing and Materials (ASTM).

4. American Welding Society: Standard Code for Arc and Gas Welding (AWS).
5. American Concrete Institute (ACI).
6. City of Berkeley Sign Ordinance.

## 1.04 SUBMITTALS

A. Product Data: Submit manufacturers' catalog sheets, brochures, illustrations, test results and/or other standard descriptive data for the following:
   1. Primers, paints and powder coatings, showing that coatings will withstand the marine environment.
   2. Lettering and graphics materials, showing that they will withstand the marine environment.

B. Shop Drawings:
   1. All shop drawings shall be neat, well organized and clearly legible.
   2. All shop drawings shall be drawn to conventional scale(s) and not subsequently reduced to fit a drawing format.
   3. Submit elevations and plan views for all sign types, including graphic layouts, complete dimensions, materials, locations of all exposed fasteners, colors and finishes. Determine the total quantity for each sign type and note it in the shop drawings.
   4. Submit comprehensive section drawings for sign types where applicable, including sections of all typical members. Show fabrication and installation details, including details for securing members to one another, to building structures, and/or to site work. Show interior construction, reinforcements, anchorages, components and finishes. Reproduction of drawings shown in the Construction Drawings shall not be acceptable.
   5. Site Condition Verification: Where required by the City for specific items, Contractor shall inspect site to confirm installation conditions, then submit shop drawings and/or written documentation for approval indicating proposed mounting devices.

C. Samples:
   1. Color and Finish: Submit 3 each, 6-inch x 6 inch samples of all paint colors, screen colors, vinyl colors, and material finishes. All paint and screen colors shall be applied to the appropriate substrate.
      a. Contractor to submit verification of paint manufacturer used for submittal.
      b. Prior to submittal, Contractor shall verify that all colors submitted as samples match accurately the samples or specifications provided by The City.

D. Prototypes: Submit one full-size complete prototype for the interpretive signs.

E. Patterns: Submit one representative full-size pattern each for all Sign Types for which a prototype is not required. All patterns shall be black vinyl graphics on a single carrier sheet and shall include the perimeter of the sign panel.

F. Quality Control: Samples, mock-ups and prototypes shall be retained by the City for record and quality control until substantial completion unless otherwise indicated by the City.

G. Adherence to Schedule:

1. Provide fabrication and installation schedule to The City for review and approval.

2. Delays: Delays caused by repeated resubmittals of unacceptable quality, or by tardy submittals or resubmittals, are the sole responsibility of Contractor and may result in the assessment of liquidated damages where applicable. All costs to The City resulting from such delays are the sole responsibility of the Contractor, who shall reimburse same.

## 1.05 QUALITY ASSURANCE

A. Contractor shall verify and be responsible for all dimensions and conditions and shall visit the site to inspect and verify field conditions prior to fabrication and installation. The City Engineer shall be notified, in writing, of all discrepancies on Drawings, in field dimensions or conditions, and of changes required in construction details.

B. Provide each type of sign as a complete unit produced by a single manufacturer, including all required mounting accessories, fittings and fastenings.

C. Completed work shall be structurally sound, and free from scratches, distortions, chips, breaks, blisters, holes, splits or other disfigurements considered as imperfections for the specific material.

D. All welding, including equipment, materials, procedures and inspection, shall conform to AWS standards.

## 1.07 DELIVERY, STORAGE AND HANDLING

A. Do not deliver materials to jobsite until installation areas are ready to receive them. Delivery shall be responsibility of Contractor, and materials shall be insured for the total value of the contents. Freight damage claims and replacement items are the responsibility of Contractor.

B. Wrap, package, transport, deliver, handle and store materials and equipment at jobsite in such a manner as required to prevent any and all damage, including damage resulting from the intrusion of foreign matter or moisture from any source.

C. Packaging:

1. Keep all packaged materials in original containers with seals unbroken and labels intact until they are incorporated into the Work.
2. Packaged material shall bear the name of manufacturer, product, brand name, color, stock number and/or other complete identifying information as applies.
3. All packages delivered to the jobsite showing indications of damage that may effect conditions of content are not acceptable.

D. Labeling: Label each sign with the correct sign location plan reference number.

E. Promptly remove all damaged or otherwise unsuitable materials and equipment from jobsite.

F. Storage: Store materials and equipment in accordance with manufacturer's instructions, above grade and properly protected from weather and construction activities.

G. Protection:

1. Protect all adjacent finished building surfaces, including jambs and soffits of openings used as passageways through which materials and equipment are handled.
2. Maintain finished surfaces clean and unmarred until occupancy by The City.

## 1.06 WARRANTY

A. Warrant work against failure because of faulty materials, workmanship and structural design for a period of one year from date of substantial completion. Warranty to include specific date on which Contractor's warranty begins, date of expiration, and name, address and telephone number of contact person during warranty period.

B. Fading, cracking, warping, peeling, delaminating, rusting, corroding, and/or structural failure, including distortion by whatever cause, shall be construed to mean failure because of faulty materials and workmanship.

C. Failures during warranty period shall be repaired or replaced to the satisfaction of, and at no cost to, the City.

D. Contractor shall guarantee unit pricing for all items for a period of one year, with an allowable cap of 10%.

## PART 2-PRODUCTS

### 2.01 MATERIALS

A. Aluminum:

1. Extruded Shapes: Provide alloy 6063; size as required, or as specified by Engineer.
2. Flat Sheet: Provide alloy 3003; mill finish as specified, for all Work which will receive a painted finish.

C. Fasteners, Hardware and Devices: Stock proprietary fastening devices of approved standard manufacture such as cadmium plated screws, bolts and washers, and stainless-steel hinges.

1. Conceal all fasteners except where noted or shown otherwise.
2. Finish on all exposed devices to match overall sign finish, unless otherwise noted.
3. Provide vandal-resistant fasteners at all exposed locations unless otherwise noted.
4. Use fasteners fabricated from metals that are noncorrosive to either the sign material(s) or the mounting surface.

D. Very High Bond Tape: Provide #4905/.020"/clear and/or #4950/.045"/white closed cell acrylic foam carrier with VHB adhesive, very high solvent resistance and very high shear and peel adhesion, as manufactured by 3M Scotch or approved equal.

### 2.02 FABRICATION

A. Intent of Specifications: All finished work shall be of the highest quality in order to pass eye-level examination and scrutiny by City.

1. All Work shall be free from burrs, dents, raw edges and sharp corners.
2. Finish all surfaces smooth unless otherwise indicated or specified.
3. Surfaces which are intended to be flat shall be free from bulges, oil canning, gaps or other physical deformities. Such surfaces shall be fabricated to remain flat under installed conditions.

4. Surfaces which are intended to be curved shall be smoothly free-flowing to the required shape(s).
5. All edges shall be true, and all corners shall be square. Where edges are specified to be painted, fill and sand smooth as required prior to painting.
6. Isolate dissimilar materials. Exercise particular care to isolate nonferrous metals from ferrous metals as required to prevent corrosion.
7. All surfaces shall be flat to a tolerance of plus or minus 1/16" when measured at any point with a ten foot straight edge.
8. All visible sign surfaces of the same type shall have the same finish. Color and/or finish shall be consistent across the entire surface of a sign.
9. All reveals shall be of uniform width; all butt joints shall be tight and closed along the entire length; all access panels shall have a nominal, uniform gap all around.
10. All gaps between milled components, when assembled, shall not exceed a tolerance of .005".

A. Provide colors and/or finish textures to be selected by the City.

## PART 3-EXECUTION

### 3.01 INSPECTION

A. Contractor shall inspect all installation locations for conditions which will adversely affect the execution, permanence and/or quality of the Work, and notify the City in writing of any and all unsatisfactory conditions. Contractor shall not proceed with installation until said unsatisfactory conditions have been corrected. Commencement of installation indicates acceptance of site conditions and guarantees delivery of an acceptable product.

### 3.02 INSTALLATION

Pre-installation Walkthrough: Attend a pre-installation walkthrough at the job site to confirm all typical installation conditions and determine installation locations for nontypical conditions. The exact locations for all exterior signs will be determined.

### 3.03 CLEANING AND PROTECTION

A. At completion of installation, clean all sign surfaces in accordance with manufacturer's instructions.

B. Protect all signs from damage until acceptance by City Engineer; repair or replace damaged units as required.

3.04 SITE CLEANUP

A. Final cleanup:

1. Clean and/or repair all evidence of installation work or damage to site work or other adjacent surfaces prior to completion of work.
2. Clean up work area after all installation has been completed. Restore all disturbed ground cover.
3. Remove all protective materials and dispose of properly off site.

3.05 CONTRACT CLOSE-OUT ITEMS

A. Provide The City with written instructions for proper cleaning of the signs. Note any solvents that should not be used.

## PART 4 - MEASUREMENT AND PAYMENT

The Contract LUMP SUM price paid for OFFSHORE MARINA AND APPURTENANCES and for LANDSIDE MARINA AND APPURTENANCES shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved in furnishing and installing exterior signage, complete in place, as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the engineer.

END OF SECTION

# SECTION 12 93 00

# SITE FURNISHINGS

## PART 1 – GENERAL

### 1.01 SCOPE

A. This Section includes the following site and street furnishings, including footings, fittings, connectors, and materials required for installation:

1. (4) ADA Detectable Warning Surface Tactiles (Domes)

2. (1) Reinstall of Pipe Bollards

### 1.02 SUBMITTALS

A. Product Data: Manufacturer's current printed specifications and catalogue cuts for each site and street furnishing required.

B. Shop Drawings: Show plans, elevations, with dimensions and installation details. Submit to City for approval.

C. Samples: Color and finish for each type of furnishing.

### 1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Show not less than 5-years successful and continuous experience in work of the type required.

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. Packaging and Labeling: Furnish materials in manufacturer's unopened, original packaging, bearing original labels showing quantity, description and name of manufacturer. Verify that all materials and components are adequately padded and securely bound in such a manner that no damage occurs to the product during delivery and unloading at the site.

B. Storage: Damaged materials will be rejected. Remove damaged materials from the job site immediately and pay cost of replacement. Determination of damage shall be the sole authority of the City.

C. Painted Finishes: Provide non-scratching, non-staining, firmly bound covering for all shop-painted finishes until installed and accepted.

### 1.05 SEQUENCING AND SCHEDULING

A. Coordination: Coordinate with the work of other sections to insure the following sequence of construction. Set anchors or sleeves in place and pour footings prior to installation of adjacent paving.

1.06 MAINTENANCE

A. Maintenance Service: Immediately remove stains to materials or surrounding site improvements. Do not use cleaning solvents harmful to site materials. Do not permit cleaning agents to contaminate planted areas.

**PART 2 – PRODUCTS**

2.01 SITE AND STREET FURNISHINGS

A. ADA Detectable Warning Surface Tactile (Domes)

1. (4) 3ft x 5ft heavy duty galvanized steel, post installed tactile.

   Powder coated safety yellow.

B. Pipe Bollards

1. Remove, protect and reinstall pipe bollard.

**PART 3 – EXECUTION**

3.01 EXAMINATION

A. Verify that site and street furnishings can be installed at indicated locations.

B. Verify that no defects or errors exist in the work of other Sections that would lead to defective installation or latent defects in workmanship and function of items in this Section.

3.02 INSTALLATION

A. General: Install site and street furnishings where indicated in accordance with manufacturer’s instructions.

B. Install per City standard detail: embedment or surface mount per city standard detail or per the City's direction.

C. Provide new and touch up damage to paint as needed.

3.03 PROTECTION

A. Wrappings: Do not remove protective wrappings from furnishings until instructed by the City Project Manager.

## PART 4 - MEASUREMENT AND PAYMENT

The Contract LUMP SUM price paid for LANDSIDE MARINA AND APPURTENANCES and for ACCESSIBILITY IMPROVEMENTS AND LANDSCAPING shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved in furnishing and installing site furnishings including ADA detectable domes and pipe bollards, complete in place, as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the engineer.

END OF SECTION

# SECTION 21 00 00

# FIRE PROTECTION CABINETS

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of all fire protection systems as indicated on the Project Drawings and specified herein.

### 1.02 SUMMARY

A. Section Includes:

1. Fire-protection cabinets for the following:

a. Portable fire extinguishers.
b. Fire hose valves.
c. Fire hoses and racks.

B. Related Requirements:

1. Section 21 12 00 "Fire Suppression Standpipes" for fire-hose connections

### 1.03 PREINSTALLATION CONFERENCE

A. Preinstallation Conference: Conduct conference at Project site or where designated.

1. Review methods and procedures related to fire-protection cabinets including, but not limited to, the following:

a. Schedules and coordination requirements.

### 1.04 ACTION SUBMITTALS

A. Product Data: For each type of product. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing surface-mounting method and relationships of box and trim to surrounding construction.

1. Show location of knockouts for hose valves.

B. Shop Drawings: For fire-protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

D. Samples for Initial Selection: For each type of exposed finish required.

E. Product Schedule: For fire-protection cabinets. Indicate mounting. Coordinate final fire-protection cabinet schedule with fire-extinguisher and hose schedule to ensure proper fit and function.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.06 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers, hoses, hose valves, and hose racks indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with deck and railing.

## PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

2.02 FIRE-PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher, hose, rack, and valve. Suitable for outdoor marine environment.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Guardian Fire Equipment, Inc.
    b. Henderson Marine Supply.
    c. Potter Roemer.

B. Cabinet Construction: Nonrated.

1. Fire-Rated Cabinets: Construct fire-rated cabinets with walls fabricated from minimum 1/8-inch fiberglass. Provide factory-drilled mounting holes.

C. Cabinet Material: Fiberglass.

1. Shelf: Same metal and finish as cabinet.

D. Surface-Mounted Cabinet: Cabinet box fully exposed and mounted directly on deck with no trim.

E. Door Material: Fiberglass.

F. Door Style: Vertical duo panel with frame.

G. Door Glazing: Break glass.

H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide recessed door pull and friction latch, manufacturer's standard.
2. Provide manufacturer's standard hinge permitting door to open 180 degrees.

I. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
2. Break-Glass Strike: Manufacturer's standard metal strike, complete with chain and mounting clip, secured to cabinet.
3. Door Lock: Stainless Steel Cylinder lock, keyed alike to other cabinets.
4. Fire Extinguisher: Nickel-plated, polished-brass body valves, Stainless steel handles and levers, with pictorial marking instruction label system complying with NFPA 10. Regular Dry-Chemical Type in Aluminum Container, minimum 2A-20 B:C and 2.5 lb capacity with sodium bicarbonate-based dry chemical in enameled-aluminum container. Provide manufacturer's standard stainless steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated baked-enamel finish

5. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.

    a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER INSIDE"

        1) Location: Applied to cabinet door or cabinet glazing.
        2) Application Process: Silk-screened or Decals.
        3) Lettering Color: Red.

J. Materials:

1. Fiberglass.

    a. Finish: Gel coat.
    b. Color: Yellow.

2. Tempered Break Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 1.5 mm thick.

## 2.03 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Provide factory-drilled mounting holes.
2. Prepare doors and frames to receive locks.
3. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners formed and if needed ground smooth.

## 2.04 GENERAL FINISH REQUIREMENTS

A. Protect finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping. Provide a marine environment rated clear coat over fiberglass for site installation.

B. Finish fire-protection cabinets after assembly.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

A. Examine roughing-in for valves and cabinets to verify actual locations of piping connections before cabinet installation.

B. Examine deck and rail for suitable installation where cabinets will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Examine fire extinguishers for proper charging and tagging.

E. Remove and replace damaged, defective, or undercharged fire extinguishers

### 3.02 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
2. Hose and Valve Cabinets:

    a. Install cabinet with not more than 1/16-inch tolerance between pipe OD and knockout OD. Center pipe within knockout.
3. Fire Extinguishers:

    a. Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

### 3.03 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for fire protection cabinets shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 21 05 29

# HANGERS AND SUPPORTS FOR FIRE SUPPRESSION PIPING

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of all hangers and support systems for piping as indicated on the Project Drawings and specified herein.

### 1.02 SUMMARY

A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.

B. Related Sections:

1. Section 05 50 00 "Metal and Hardware" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.

### 1.03 DEFINITIONS

A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

### 1.04 PERFORMANCE REQUIREMENTS

A. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. Design seismic-restraint hangers and supports for piping and obtain approval from the Engineer.

## 1.05 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:

1. Trapeze pipe hangers.
2. Metal framing systems.
3. Structural Pipe Supports.

C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of trapeze hangers.
2. Design Calculations: Calculate requirements for designing trapeze hangers.

D. Certification: Prior to welding, submit certification for each welder stating the type of welding and positions qualified for, the code and procedure qualified under, date qualified, and the firm and individual certifying the qualifications tests. If the qualification date of the welding operator is more than one-year old, the welding operator's qualification certificate shall be accompanied by a current certificate by the welder attesting to the fact that he has been engaged in welding since the date of certification, with no break in welding service greater than 6 months. Conform to requirements specified in AWS D1.1/D1.1M and AWS D1.6/D1.6M.

## 1.06 QUALITY ASSURANCE

A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Structural Stainless Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.6/D1.6M, "Structural Welding Code – Stainless Steel."

C. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

# PART 2 - PRODUCTS

## 2.01 METAL PIPE HANGERS AND SUPPORTS

A. 316 Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of 316 stainless steel.

## 2.02 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural 316 stainless-steel shapes with MSS SP-58 316 stainless-steel hanger rods, nuts, saddles, and U-bolts.

## 2.03 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Allied Tube & Conduit.
    b. Cooper B-Line, Inc.
    c. Flex-Strut Inc.
    d. Unistrut Corporation; Tyco International, Ltd.

2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
3. Standard: MFMA-4.
4. Channels: Continuous slotted 316 stainless steel channel with inturned lips.
5. Channel Nuts: Formed or stamped 316 stainless steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of 316 stainless steel.

## 2.04 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-316 stainless steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, 316 stainless-steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

## 2.05 STRUCTURAL PIPING SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural 316 stainless-steel shapes.

## 2.06 MISCELLANEOUS MATERIALS

A. Structural Stainless Steel: ASTM A 276 and A484, 316 stainless-steel plates, shapes, and bars.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

# PART 3 - EXECUTION

## 3.01 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with NFPA 13, MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with NFPA 13, MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
2. Field fabricate from stainless-steel shapes selected for loads being supported. Weld stainless steel according to AWS D1.6/D1.6M.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

D. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches (100 mm) thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

F. Equipment Support Installation: Fabricate from welded-structural-stainless-steel shapes.

G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

H. Install lateral bracing with pipe hangers and supports to prevent swaying.

I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 (DN 65)] and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

## 3.02 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and pipe supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M and AWS D1.6/D1.6M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

## 3.03 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches (40 mm).

## 3.04 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).

## 3.05 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment. All piping hangers, supports and hardware shall be 316 stainless steel unless otherwise noted on the drawings. Hangers and Supports shall comply with NFPA 13.

B. Comply with NFPA 13 and MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use 316 stainless-steel pipe hangers and supports, and stainless-steel attachments for hostile environment applications.

D. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).
2. Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 (DN 15 to DN 600) if little or no insulation is required.
3. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4 (DN 15 to DN 100), to allow off-center closure for hanger installation before pipe erection.
4. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8 (DN 20 to DN 200).

5. Adjustable, Band Hangers (MSS Type 7 or 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
6. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
7. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8 (DN 10 to DN 200).
8. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3 (DN 10 to DN 80).
9. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).

E. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24 (DN 24 to DN 600).
2. 316 Stainless-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 (DN 20 to DN 600) if longer ends are required for riser clamps.

F. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
2. Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.

G. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. 316 Stainless Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete deck.
2. Welded-Stainless Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb (340 kg).
    b. Medium (MSS Type 32): 1500 lb (680 kg).
    c. Heavy (MSS Type 33): 3000 lb (1360 kg).

3. Side-Beam Brackets (MSS Type 34): For sides of steel beams.
4. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
5. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

H. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

I. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

J. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for hangers and support for fire suppresion shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 21 11 00

# FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of all fire suppression water service piping systems as indicated on the Project Drawings and specified herein.

B. Refer to section Appendix for Fire-Suppression Water Hydraulic Calculations.

### 1.02 SUMMARY

A. Section includes fire-suppression water-service piping and related components outdoors, and the following:

1. Pipes, fittings, and specialties.
2. Fire-suppression specialty valves.

B. Related Requirements:

1. Section 21 12 00 "Fire-Suppression Standpipes" for fire-suppression standpipes.
2. Section 22 05 16 “Expansion Fittings For Piping” for fire-suppression hose fittings above ground where indicated on the drawings.

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

### 1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: For piping and specialties including relation to other services in same area, drawn to scale. Show piping and specialty sizes and valves, meter and specialty locations, and elevations.

B. Field quality-control reports.

## 1.05 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Comply with requirements of utility company supplying the water. Include tapping of water mains and backflow prevention.
2. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Comply with FM Global's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.

D. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-suppression water-service piping.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.
2. Protect valves against damage to threaded ends and flange faces.
3. Set valves in best position for handling. Set valves closed to prevent rattling.

B. During Storage: Use precautions for valves, including fire hydrants, according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

F. Protect flanges, fittings, and specialties from moisture and dirt.

G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.07 PROJECT CONDITIONS

A. Interruption of Existing Fire-Suppression Water-Service Piping: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:

1. Notify Construction Manager and Owner no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Construction Manager's or Owner's written permission.

**PART 2 - PRODUCTS**

2.01 LISTED FIRE-PROTECTION VALVES

A. General Requirements:

1. Valves shall be UL listed or FM approved.
2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig (1200 kPa).

B. Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Anvil International, Inc.
b. Victaulic Company.

2. Standard: UL 1091 except with ball instead of disc.
3. Valves NPS 2 and NPS 2-1/2: 316 Stainless Steel body with threaded ends.

C. 316 Stainless Steel OS&Y Gate Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Crane Co.; Crane Valve Group.
b. Milwaukee Valve Company.
c. NIBCO INC.
d. United Brass Works, Inc.

2. Standard: UL 262.
3. Pressure Rating: Class 150.
4. Body Material: Stainless Steel 316.
5. End Connections: Threaded.

## 2.02 PE PIPE AND FITTINGS

A. PE, Fire-Service Pipe: FM Global approved, with minimum thickness equivalent to Class 150.

B. Molded PE Fittings: FM Global approved; PE butt-fusion type, made to match PE pipe dimensions and class.

## 2.03 SPECIAL PIPE FITTINGS

A. Stainless Steel Flexible Expansion Joints:

1. Description: Provide flexible expansion joints on fire suppression piping where indicated. Refer to Section 2200516 “Expansion Fittings for Piping”.

## 2.04 JOINING MATERIALS

A. Gaskets for Ferrous Piping: ASME B16.21, asbestos free.

## 2.05 PIPING SPECIALTIES

A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

## 2.06 CURB VALVES

A. Curb Valves: Comply with AWWA C800 for high-pressure, service-line valves. Valve has bronze body, ground-key ball, wide tee head, and inlet and outlet matching service piping material.

B. Service Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over curb valve and with a barrel approximately 3 inches in diameter.

1. Shutoff Rods: Steel; with tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

## 2.07 DETECTOR CHECK VALVES

A. Description: Epoxy coated ductile-iron body, bolted cover with air-bleed device for access to internal parts, and flanged ends. Corrosion protective coating shall include electrochemical corrosion inhibitor primer, microbrial inhibitor and epoxy topcoat. Include one-piece bronze disc with bronze bushings, pivot, and replaceable seat. Include threaded bypass taps in inlet and outlet for bypass meter connection. Set valve to allow minimal water flow through bypass meter when major water flow is required. Flange connections shall be compliant to ASME B16.1 Class 125.

B. Standards: UL 312 and FM Global's "Approval Guide."

C. Pressure Rating: 175 psig.

## 2.08 BACKFLOW PREVENTERS

A. Reduced-Pressure-Principle Backflow Preventers:
   1. Standard: ASSE 1013 and AWWA C511.
   2. Operation: Continuous-pressure applications.
   3. Pressure Loss: 12 psig maximum, through middle one-third of flow range.
   4. Size: Refer to Drawings.
   5. Body Material: Ductile iron with coating and interior lining complying with AWWA C550, or stainless steel for NPS 2-1/2 and larger. Refer to Drawings.
   6. End Connections: Flanged for NPS 2-1/2 and larger.
   7. Configuration: Designed for horizontal, straight through flow.
   8. Accessories:
      a. Valves: OS&Y gate type with flanged ends on inlet and outlet of NPS 2-1/2 and larger.
      b. Air-Gap Fitting: ASME A112.1.2, matching backflow preventer connection.

B. Backflow Preventer Test Kits:
   1. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

## 2.09 ALARM DEVICES

A. General: UL 753 and FM Global's "Approval Guide" listing, of types and sizes to mate and match piping and equipment.

B. Supervisory Switches: Single pole, double throw; designed to signal valve in other than fully open position.

## PART 3 - EXECUTION

### 3.01 PIPING INSTALLATION

A. Water-Main Connection: Arrange with water utility company for tap of size and in location indicated in water main.

B. Comply with NFPA 24 for fire-service-main piping materials and installation.

C. Install PE pipe according to ASTM D 2774 and ASTM F 645.

D. Bury piping with depth of cover over top at least 30 inches, in accordance with the drawings, and according to the following:

1. Under Walkays/Driveways: With at least 36 inches cover over top.
2. In Loose Gravelly Soil and Rock: With at least 12 inches of additional cover.

E. Extend fire-suppression water-service piping and connect to water-supply source at locations and pipe sizes indicated.

F. Comply with requirements for fire-suppression water-service piping in the following Sections:

1. Section 211200 "Fire-Suppression Standpipes"

G. Comply with requirements in Section 221116 "Domestic Water Piping" for potable-water piping.

### 3.02 JOINT CONSTRUCTION

A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure rating same as or higher than systems pressure rating for aboveground applications unless otherwise indicated.

B. Install unions adjacent to each valve in tubing NPS 2 and smaller.

C. Install flanges, flange adaptors, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.

D. Ream ends of tubes and remove burrs.

E. Remove scale, slag, dirt, and debris from outside and inside of pipes, tubes, and fittings before assembly.

F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with bolts according to ASME B31.9.

G. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.

H. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure.

I. Do not use flanges or unions for underground piping.

## 3.03 ANCHORAGE INSTALLATION

A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:

1. Pipe clamps and tie rods.

B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches in fire-suppression water-service piping according to NFPA 24 and the following:

1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.

C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

## 3.04 VALVE INSTALLATION

A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44.

B. AWWA Valves Other Than Gate Valves: Comply with AWWA C600 and AWWA M44.

C. UL-Listed or FM Global-Approved Gate Valves: Comply with NFPA 24.

D. UL-Listed or FM Global-Approved Valves Other Than Gate Valves: Comply with NFPA 24.

E. MSS Valves: Install as component of connected piping system.

F. Support valves and piping, not direct buried, on concrete piers. Comply with requirements for concrete piers in Section 033000 "Cast-in-Place Concrete."

## 3.05 BACKFLOW PREVENTER INSTALLATION

A. Install backflow preventers of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.

B. Do not install backflow preventers that have relief drain in vault or in other spaces subject to flooding.

C. Do not install bypass piping around backflow preventers.

D. Support NPS 2-1/2 and larger backflow preventers and piping on concrete piers. Comply with requirements for concrete piers in Section 033000 "Cast-in-Place Concrete."

## 3.06 FIRE-DEPARTMENT CONNECTION INSTALLATION

A. Install ball drip valves at each check valve for fire-department connection to mains.

## 3.07 ALARM DEVICE INSTALLATION

A. General: Comply with NFPA 24 for devices and methods of valve supervision. Underground valves with valve box do not require supervision.

B. Locking and Sealing: Secure unsupervised valves as follows:

1. Valves: Install chain and padlock on open OS&Y gate valve.

C. Pressure Switches: Drill and thread hole in exposed barrel of fire hydrant. Install switch.

D. Connect alarm devices to facility’s fire-alarm system.

## 3.08 CONNECTIONS

A. Connect fire-suppression water-service piping to utility water main.

## 3.09 FIELD QUALITY CONTROL

A. Use test procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described below.

B. Piping Tests: Conduct piping tests before joints are covered. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

C. Hydrostatic Tests: Test at not less than one-and-one-half times the working pressure for two hours.

1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for one hour; decrease to zero psig (zero kPa). Slowly increase again to test pressure and hold for one more hour. Maximum

allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

D. Prepare test and inspection reports.

## 3.10 IDENTIFICATION

A. Permanently attach plastic marker indicating fire-suppression water-service piping.

## 3.11 CLEANING

A. Clean and disinfect fire-suppression water-service piping as follows:

1. Purge new piping systems and parts of existing systems that have been altered, extended, or repaired before use.
2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.
3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or do as follows:

    a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow it to stand for 24 hours.
    b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow it to stand for three hours.
    c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
    d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.

B. Prepare reports of purging and disinfecting activities.

## 3.12 PIPING SCHEDULE

A. Underground fire-suppression water-service piping NPS 4 shall be one of the following:

1. PE, Class 150, fire-service pipe; molded PE fittings; and heat-fusion joints.

B. Aboveground fire-suppression water-service piping NPS 2 and smaller shall be HDPE pipe and nipples; and fusion joints.

C. Aboveground fire-suppression water-service piping NPS 3 and NPS 4 shall be one of the following:

1. HDPE pipe; and fusion joints.

D. Aboveground fire-suppression backflow preventer water-service piping shall be flanged-end standard pattern, ductile-iron pipe; glands, gasketed; with 316 stainless steel bolts and hardware and with marine environment epoxy coating.

3.13 VALVE SCHEDULE

A. Standard-pressure, aboveground fire-suppression water-service shutoff valves NPS 3 and larger shall be one of the following:

1. 200-psig, AWWA, 316 stainless steel, OS&Y, metal resilient-seated gate valves.
2. 175-psig, UL-listed or FM Global-approved, 316 stainless steel, OS&Y gate valves.

B. Fire-suppression water-service check valves NPS 3 and larger shall be one of the following:

1. UL-listed or FM Global-approved check valves.
2. UL-listed or FM Global-approved detector check valves.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for facility fire-suppresion water-service piping shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# APPENDIX – FIRE-SUPPRESSION WATER HYDRAULIC CALCULATION

# Hydraulic Calculations by HydraCALC

YEI ENGINEERS
7677 Oakport Street
Suite 200
Oakland, CA 94621
(510) 383-1050

| | | |
|---|---|---|
| Job Name | : | |
| Drawing | : | NA |
| Location | : | Berkeley Dock |
| Remote Area | : | 1 |
| Contract | : | |
| Data File | : | Standpipe Calc.WXF |

HYDRAULIC DESIGN INFORMATION SHEET

Name - KF
Date - 10/27/23
Location - Berkeley Dock
Building - NA
System No. - 1
Contractor -
Contract No. -
Calculated By - YEI Engineers
Drawing No. -
Occupancy -

SYSTEM DESIGN

(X)NFPA 14 Number of Standpipes ( )1 (X)2 ( )3 ( )4 ( )
( )Other
( )Specific Ruling Made by KF Date 10/27/23

| | | | | |
|---|---|---|---|---|
| Flow at Top Most Outlet | - 250 | Gpm | System Type | |
| Pres. at Top Most Outlet | - 100 | Psi | (X) Wet | ( ) Dry |
| Flow For Ea. Additional Standpipe | - 250 | Gpm | | |
| Total Additional Flow | - 750 | Gpm | | |
| Elevation at Highest Outlet | - 3 | Feet | | |
| Hose Valve Connection | ( )1 1/2" | (X)2 1/2" | | |
| Class Service | (X)I | ( )II | ( )III | |
| Note: | | | | |

Calculation Summary
Gpm Required
C-Factor Used:
Psi Required
Overhead
At Test
Underground 0

WATER SUPPLY

Water Flow Test:
Date of Test - 07/15/22
Time of Test -
Static (Psi) - 92
Residual (Psi) - 69
Flow (Gpm) - 750
Elevation - 12

Pump Data:
Rated Cap. 3000
@ Psi 150
Elev.

Tank or Reservoir:
Cap.
Elev.
Well
Proof Flow Gpm

Location: Hydrant 3 Spinnaker Way

Source of Information: EBMUD Fire Service

Fitting Legend

| Abbrev. | Name | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E | NFPA 13 90' Standard Elbow | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 14 | 18 | 22 | 27 | 35 | 40 | 45 | 50 | 61 |
| T | NFPA 13 90' Flow thru Tee | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 15 | 17 | 20 | 25 | 30 | 35 | 50 | 60 | 71 | 81 | 91 | 101 | 121 |

Units Summary

| | |
|---|---|
| Diameter Units | Inches |
| Length Units | Feet |
| Flow Units | US Gallons per Minute |
| Pressure Units | Pounds per Square Inch |

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

### SUPPLY ANALYSIS

| Node at Source | Static Pressure | Residual Pressure | Flow | Available Pressure | Total Demand | Required Pressure |
|---|---|---|---|---|---|---|
| FDC2 | See Information on Pump Curve | | | 217.37 | 750.0 | 153.041 |
| HYD | 92.0 | 36 | 1500.0 | 76.466 | 750.0 | 76.466 |

### NODE ANALYSIS

| Node Tag | Elevation | Node Type | Pressure at Node | Discharge at Node | Notes |
|---|---|---|---|---|---|
| H1 | 4.0 | | 100.0 | 250.0 | |
| H2 | 4.0 | | 101.04 | 250.0 | |
| H3 | 4.0 | | 111.45 | 250.0 | |
| ST1 | 0.0 | | 105.18 | | |
| ST2 | 0.0 | | 106.22 | | |
| ST4 | 0.0 | | 115.22 | | |
| ST3 | 0.0 | | 116.63 | | |
| ST5 | 0.0 | | 120.37 | | |
| GW2 | 0.0 | | 121.09 | | |
| GW1 | 3.0 | | 141.94 | | |
| FDC2 | 3.0 | | 153.04 | | |
| FDC | 3.0 | | 52.37 | | |
| BF2 | 3.0 | | 52.49 | | |
| BF1 | -3.0 | | 71.89 | | |
| UG1 | -3.0 | | 78.54 | | |
| HYD | 2.0 | | 76.47 | | |

| Node1 / to / Node2 | Elev1 / Elev2 | K / Fact | Qa / Qt | Nom / Act | Fitting or Eqiv | Len | Pipe Ftngs Total | CFact / Pf/Ft | Pt / Pe / Pf | ******* Notes ****** |
|---|---|---|---|---|---|---|---|---|---|---|
| H1 | 4 | + 250.00 | 250.00 | 2.5 | T | 12.0 | 4.000 | 120 | 100.000 | |
| to | | | | | | | 12.000 | | 1.732 | |
| ST1 | 0 | | 250.0 | 2.469 | | | 16.000 | 0.2154 | 3.447 | Vel = 16.75 |
| | | | 0.0 | | | | | | | |
| ST1 | | | 250.00 | | | | | | 105.179 | K Factor = 24.38 |
| H2 | 4 | + 250.00 | 250.00 | 2.5 | T | 12.0 | 4.000 | 120 | 101.037 | |
| to | | | | | | | 12.000 | | 1.732 | |
| ST2 | 0 | | 250.0 | 2.469 | | | 16.000 | 0.2154 | 3.447 | Vel = 16.75 |
| | | | 0.0 | | | | | | | |
| ST2 | | | 250.00 | | | | | | 106.216 | K Factor = 24.26 |
| H3 | 4 | + 250.00 | 250.00 | 2.5 | T | 12.0 | 4.000 | 120 | 111.452 | |
| to | | | | | | | 12.000 | | 1.732 | |
| ST3 | 0 | | 250.0 | 2.469 | | | 16.000 | 0.2154 | 3.447 | Vel = 16.75 |
| | | | 0.0 | | | | | | | |
| ST3 | | | 250.00 | | | | | | 116.631 | K Factor = 23.15 |
| ST1 | 0 | | 250.00 | 4 | | | 120.000 | 150 | 105.179 | |
| to | | | | | | | | | 0.0 | |
| ST2 | 0 | | 250.0 | 4.39 | | | 120.000 | 0.0086 | 1.037 | Vel = 5.30 |
| ST2 | 0 | | 250.00 | 4 | E | 23.033 | 266.000 | 150 | 106.216 | |
| to | | | | | | | 23.034 | | 0.0 | |
| ST4 | 0 | | 500.0 | 4.39 | | | 289.034 | 0.0312 | 9.008 | Vel = 10.60 |
| ST4 | 0 | | 0.0 | 4 | | | 165.000 | 150 | 115.224 | |
| to | | | | | | | | | 0.0 | |
| ST5 | 0 | | 500.0 | 4.39 | | | 165.000 | 0.0312 | 5.142 | Vel = 10.60 |
| | | | 0.0 | | | | | | | |
| ST5 | | | 500.00 | | | | | | 120.366 | K Factor = 45.57 |
| ST3 | 0 | | 250.00 | 4 | T | 46.066 | 386.000 | 150 | 116.631 | |
| to | | | | | | | 46.065 | | 0.0 | |
| ST5 | 0 | | 250.0 | 4.39 | | | 432.065 | 0.0086 | 3.735 | Vel = 5.30 |
| ST5 | 0 | | 500.00 | 4 | | | 11.000 | 150 | 120.366 | |
| to | | | | | | | | | 0.0 | |
| GW2 | 0 | | 750.0 | 4.39 | | | 11.000 | 0.0660 | 0.726 | Vel = 15.90 |
| GW2 | 0 | | 0.0 | 4 | 4E | 92.132 | 92.000 | 150 | 121.092 | |
| to | | | | | | | 92.133 | | 8.701 | * * Fixed Loss = 10 |
| GW1 | 3 | | 750.0 | 4.39 | | | 184.133 | 0.0660 | 12.149 | Vel = 15.90 |
| | | | 0.0 | | | | | | | |
| GW1 | | | 750.00 | | | | | | 141.942 | K Factor = 62.95 |
| GW1 | 3 | | 750.00 | 4 | 4E | 58.134 | 48.000 | 140 | 141.942 | |
| to | | | | | | | 58.134 | | 0.0 | |
| FDC2 | 3 | | 750.0 | 4.1 | | | 106.134 | 0.1046 | 11.099 | Vel = 18.23 |
| | | | 0.0 | | | | | | | |
| FDC2 | | | 750.00 | | | | | | 153.041 | K Factor = 60.63 |
| System Demand Pressure | | | | | | | | | 153.041 | |
| Safety Margin | | | | | | | | | 64.329 | |
| Continuation Pressure | | | | | | | | | 217.370 | |
| Pressure @ Pump Outlet | | | | | | | | | 217.370 | |
| Pressure From Pump Curve | | | | | | | | | -164.997 | |
| Pressure @ Pump Inlet | | | | | | | | | 52.372 | |

| Node1<br>to<br>Node2 | Elev1<br><br>Elev2 | K<br><br>Fact | Qa<br><br>Qt | Nom<br><br>Act | Fitting<br>or<br>Eqiv | Len | Pipe<br>Ftngs<br>Total | CFact<br><br>Pf/Ft | Pt<br>Pe<br>Pf | ******* Notes ****** |
|---|---|---|---|---|---|---|---|---|---|---|
| FDC | 3 | | 0.0 | 4 | | | 1.000 | 120 | 52.372 | |
| to | | | | | | | | | 0.0 | |
| BF2 | 3 | | 750.0 | 4.26 | | | 1.000 | 0.1160 | 0.116 | Vel = 16.88 |
| BF2 | 3 | | 0.0 | 4 | | | 7.000 | 120 | 52.488 | |
| to | | | | | | | | | 18.599 | * * Fixed Loss = 16 |
| BF1 | -3 | | 750.0 | 4.26 | | | 7.000 | 0.1153 | 0.807 | Vel = 16.88 |
| BF1 | -3 | | 0.0 | 4 | 3E | 43.601 | 20.000 | 140 | 71.894 | |
| to | | | | | | | 43.601 | | 0.0 | |
| UG1 | -3 | | 750.0 | 4.1 | | | 63.601 | 0.1046 | 6.650 | Vel = 18.23 |
| UG1 | -3 | | 0.0 | 12 | T | 93.767 | 84.000 | 140 | 78.544 | |
| to | | | | | | | 93.767 | | -2.166 | |
| HYD | 2 | | 750.0 | 12.34 | | | 177.767 | 0.0005 | 0.089 | Vel = 2.01 |
| | | | 0.0 | | | | | | | |
| HYD | | | 750.00 | | | | | | 76.467 | K Factor = 85.77 |

**EBMUD FIRE SERVICE AVAILABLE FLOW & PRESSURE INFORMATION**

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**Contact Information:**

Bryan Hayes
YEI Engineers
7677 Oakport Street Suite 200
Oakland, 94605

**Request Number: 7714**

**E-mail:** bhayes@yeiengineers.com
**Phone:** 2098144930
**Cell:**
**Fax:**

**Property Information**:

7 Spinnaker Way
BERKELEY, 94720

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The following available flow and pressure information is based on a Maximum Day Demand Hydraulic Model Analysis of EBMUD's water distribution system. This information should be used as a guideline of the approximate available flow. It is recommended that a design allowance be made for possible reductions in pressure and/or flow that could occur under other possible scenarios. Applicant understands that the District cannot guarantee any specific values for pressure and flow. If you have any questions, please contact us at nbo@ebmud.com or call (510)287-1008.

**Available flow and pressure at possible fire service connection for above property:**

**Possible Fire Service Connection #1**
Existing Hydrant location, Hydrant No. 14592, located off off the 12-inch main (12SMM70) in Breakwater Drive, on the east side of Breakwater Drive, approximately 20 feet south of Spinnaker Way.

**Pressure Zone:** Central
**Connection Point Elevation (feet)**: 17
**Connection Point Static Pressure (psi):** 90
**Residual Pressure at gpm (psi)**:
**Residual Pressure at 0 gpm (psi)**: 83
**Residual Pressure at 750 gpm (psi):** 66
**Residual Pressure at 1500 gpm (psi):** 31

**Possible Fire Service Connection #2**
Off the 8-inch main (8SMB81) in Spinnaker Way, on the south side of Spinnaker Way, approximately 50 feet west of Breakwater Drive.

**Pressure Zone:** Central
**Connection Point Elevation (feet)**: 19
**Connection Point Static Pressure (psi):** 89
**Residual Pressure at gpm (psi)**:
**Residual Pressure at 0 gpm (psi)**: 82
**Residual Pressure at 750 gpm (psi):** 65
**Residual Pressure at 1500 gpm (psi):** 30

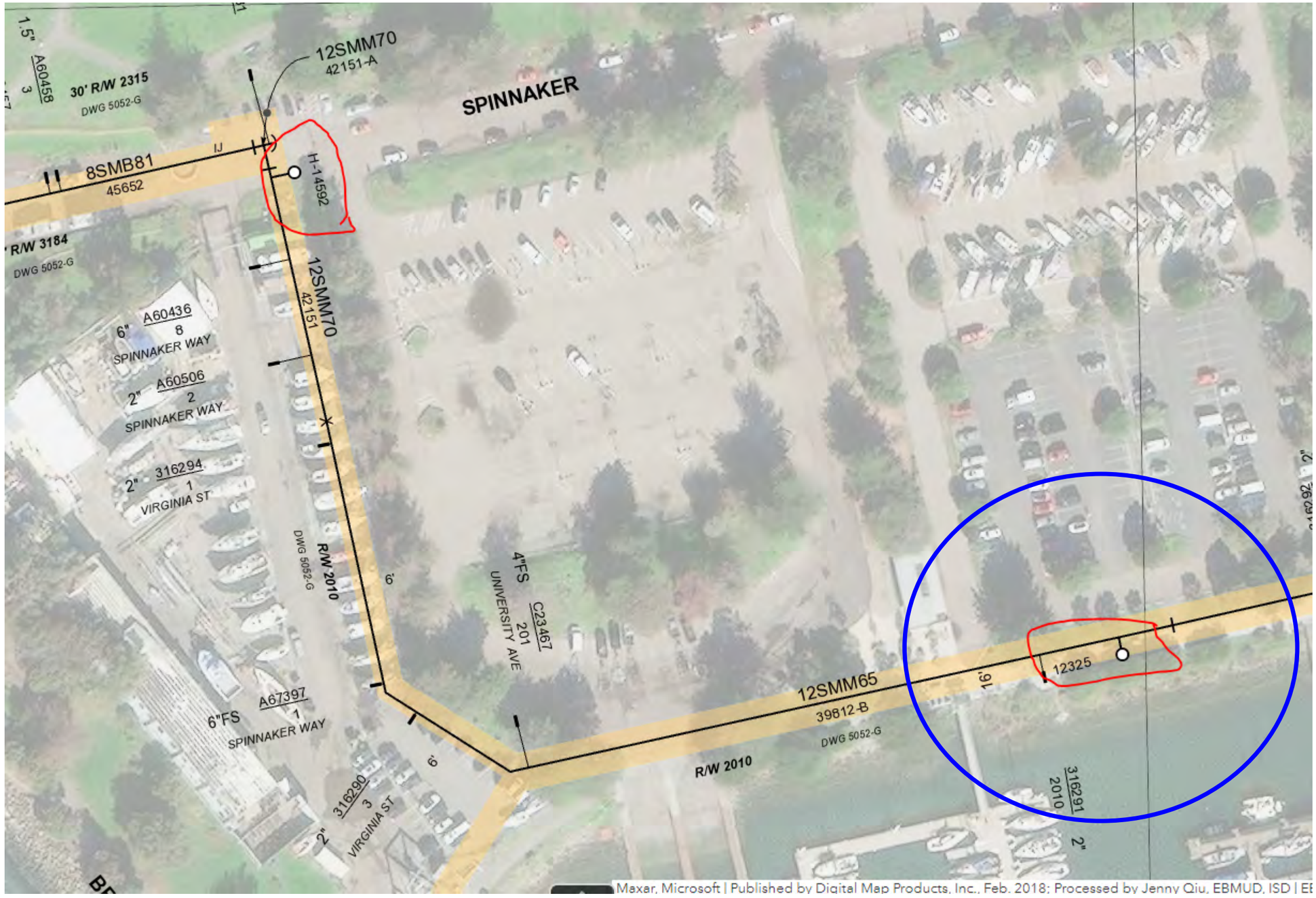
**Possible Fire Service Connection #3**
Existing Hydrant location, Hydrant No. 12325, located off off the 12-inch main (12SMM65) in Right-Of-Way 2010, on the south side of Right-Of-Way 2010, approximately 955 feet south of Spinnaker Way.

**Pressure Zone:** Central
**Connection Point Elevation (feet)**: 12
**Connection Point Static Pressure (psi):** 92
**Residual Pressure at gpm (psi):**
**Residual Pressure at 0 gpm (psi)**: 86
**Residual Pressure at 750 gpm (psi):** 69
**Residual Pressure at 1500 gpm (psi):** 36

**Engineer's Comments:** The pressure and flow information stated is available at the street main connection on Breakwater Drive, Spinnaker Way, and Right-Of-Way 2010. Connection #1 is also representative of pressure and flow available at the street main connection for existing public hydrant, Hydrant No. 14592. Connection #3 is an existing public hydrant location and is not potential fire or water service connections to the property.

Flow and pressure data is valid for one year after the approval date. You will need to submit a new request and pay applicable fee after the expiration date.

**NBO:** WMACH **Engineer:** DCHIU **Supervisor:** JMCGREGO **Date:** 2022-07-15 13:48:10.0






***The information provided is not a proposal to provide water service and is based on preliminary information and is subject to revision. A completed water service application is needed for final determination.***

# SECTION 21 11 19

# FIRE DEPARTMENT CONNECTIONS

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of the fire department connection equipment as indicated on the Project Drawings and specified herein.

### 1.02 SUMMARY

A. Section Includes:

1. Exposed-type fire-department connections.

### 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 each fire-department connection.

## PART 2 - PRODUCTS

### 2.01 EXPOSED-TYPE FIRE-DEPARTMENT CONNECTION

A. Standard: UL 405.

B. Type: Exposed, for pipe flange mounting.

C. Pressure Rating: 175 psig minimum.

D. Body Material: Corrosion-resistant metal.

E. Inlets: Marine environment type, with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, lugged swivel connections, and check devices or clappers. Provide Storz connection as indicated on drawings.

F. Caps: Lugged type, with gasket and chain for marine environment.

G. Outlet: Back, with pipe threads.

H. Number of Inlets: Two.

I. Finish: Rough brass or bronze.

J. Outlet Size: NPS 4.

K. Storz Connection size: NPS 5.

## PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fire-department connections.

B. Examine roughing-in for fire-suppression standpipe system to verify actual locations of piping connections before fire-department connection installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install flanged-end fire-department connections.

B. Install two protective pipe bollards around each fire-department connection. Comply with requirements for bollards in Section 055000 "Metal and Hardware."

C. Install automatic (ball-drip) drain valve at each check valve for fire-department connection.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for Fire Department connections shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 21 12 00

# FIRE-SUPPRESSION STANDPIPES

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of the fire-suppression standpipes as indicated on the Project Drawings and specified herein.

### 1.02 SUMMARY

A. Section Includes:

1. Pipes, fittings, and specialties.
2. Fire-protection valves.
3. Hose connections.

### 1.03 DEFINITIONS

A. Standard-Pressure Standpipe Piping: Fire-suppression standpipe piping designed to operate at working pressure 175 psig maximum.

### 1.04 SYSTEM DESCRIPTIONS

A. Automatic Wet-Type, Class I Standpipe System: Includes NPS 2-1/2 (DN 65) hose connections. Has open water-supply valve with pressure maintained and is capable of supplying water demand.

### 1.05 PERFORMANCE REQUIREMENTS

A. Standard-Pressure, Fire-Suppression Standpipe System Component: Listed for 175-psig minimum working pressure.

B. Fire-suppression standpipe design shall be approved by authorities having jurisdiction.

1. Minimum residual pressure at each hose-connection outlet is as follows:
   a. NPS 2-1/2 Hose Connections: 100 psig.

2. Maximum residual pressure at required flow at each hose-connection outlet is as follows unless otherwise indicated:

a. NPS 2-1/2 Hose Connections: 175 psig.

C. Seismic Performance: Fire-suppression standpipes shall withstand the effects of earthquake motions determined according to NFPA 13 and ASCE/SEI 7.

## 1.06 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories.

B. Shop Drawings: For fire-suppression standpipes. Include plans, elevations, sections, details, and attachments to other work.

## 1.07 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Approved Standpipe Drawings: Working plans, prepared according to NFPA 14, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

C. Welding certificates.

D. Fire-hydrant flow test report.

E. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 14. Include "Contractor's Material and Test Certificate for Aboveground Piping" and "Contractor's Material and Test Certificate for Underground Piping."

F. Field quality-control reports.

## 1.08 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-suppression standpipes specialties to include in emergency, operation, and maintenance manuals.

## 1.09 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing fire-suppression standpipes and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.

a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.

B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

C. NFPA Standards: Fire-suppression standpipe equipment, specialties, accessories, installation, and testing shall comply with NFPA 14, "Installation of Standpipe and Hose Systems."

1.10 PROJECT CONDITIONS

A. Interruption of Existing Fire-Suppression Standpipe Service: Do not interrupt fire-suppression standpipe service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary fire-suppression standpipe service according to requirements indicated:

1. Notify Construction Manager no fewer than two days in advance of proposed interruption of fire-suppression standpipe service.
2. Do not proceed with interruption of fire-suppression standpipe service without Construction Manager's written permission.

**PART 2 - PRODUCTS**

2.01 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

2.02 PIPE AND FITTINGS

A. SDR 9 HDPE piping with fused joints.

2.03 LISTED FIRE-PROTECTION VALVES

A. General Requirements:

1. Valves shall be UL listed or FM approved.
2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig.

B. Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Anvil International, Inc.
    b. Victaulic Company.

2. Standard: UL 1091 except with ball instead of disc.
3. Valves NPS 2 and NPS 2-1/2: 316 Stainless Steel body with threaded ends.

C. 316 Stainless Steel OS&Y Gate Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Crane Co.; Crane Valve Group.
    b. Milwaukee Valve Company.
    c. NIBCO INC.
    d. United Brass Works, Inc.

2. Standard: UL 262.
3. Pressure Rating: Class 150.
4. Body Material: Stainless Steel 316.
5. End Connections: Threaded.

## 2.04 TRIM AND DRAIN VALVES

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig minimum.
3. Body Material: Stainless Steel 316.

B. Angle Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Fire Protection Products, Inc.
    b. United Brass Works, Inc.

C. Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Anvil International, Inc.
    b. Milwaukee Valve Company.
    c. NIBCO INC.
    d. Red-White Valve Corporation.
    e. Tyco Fire & Building Products LP.
    f. Victaulic Company.

2.05 HOSE CONNECTIONS

A. Nonadjustable-Valve Hose Connections:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Elkhart Brass Mfg. Company, Inc.
    b. Fire Protection Products, Inc.
    c. Guardian Fire Equipment, Inc.
    d. Mueller Co.; Water Products Division.
    e. NIBCO INC.
    f. Tyco Fire & Building Products LP.

2. Standard: UL 668 hose valve for connecting fire hose.
3. Pressure Rating: 300 psig (2070 kPa) minimum.
4. Material: Brass or 316 Stainless Steel.
5. Size: NPS 1-1/2 or NPS 2-1/2, as indicated.
6. Inlet: Female pipe threads.
7. Outlet: Male hose threads with lugged cap, gasket, and chain. Include hose valve threads according to NFPA 1963 and matching local fire-department threads.
8. Pattern: Angle.
9. Finish: Rough.

## PART 3 - EXECUTION

3.01 PREPARATION

A. Perform fire-hydrant flow test according to NFPA 14 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.

B. Report test results promptly and in writing.

## 3.02 EXAMINATION

A. Examine roughing-in for hose connections to verify actual locations of piping connections before installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.03 WATER-SUPPLY CONNECTIONS

A. Connect fire-suppression standpipe piping to water-distribution piping.

## 3.04 PIPING INSTALLATION

A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.

1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.

B. Piping Standard: Comply with requirements in NFPA 14 for installation of fire-suppression standpipe piping.

C. Install seismic restraints on piping. Comply with requirements in NFPA 13 for seismic-restraint device materials and installation.

D. Install listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

E. Install hangers and supports for standpipe system piping according to NFPA 14. Comply with requirements in NFPA 13 for hanger materials.

F. Fill wet-type standpipe system piping with water.

## 3.05 JOINT CONSTRUCTION

A. Install couplings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.

B. Install flanges on valves, apparatus, and equipment having NPS 2-1/2 (DN 65) and larger end connections.

C. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

D. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

F. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

## 3.06 VALVE AND SPECIALTIES INSTALLATION

A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 14 and authorities having jurisdiction.

B. Specialty Valves:

1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.

## 3.07 HOSE-CONNECTION INSTALLATION

A. Install hose connections adjacent to standpipes.

B. Install freestanding hose connections for access and minimum passage restriction.

C. Install NPS 2-1/2 (DN 65) hose connections with quick-disconnect NPS 2-1/2 by NPS 1-1/2 (DN 65 by DN 40) reducer adapter and flow-restricting device.

## 3.08 IDENTIFICATION

A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 14.

## 3.09 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Flush, test, and inspect standpipe systems according to NFPA 14, "System Acceptance" Chapter.
4. Verify that equipment hose threads are same as local fire-department equipment.

C. Fire-suppression standpipe system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.10 DEMONSTRATION

A. Engage a factory-authorized service representative to train or train owner's maintenance personnel to adjust, operate, and maintain specialty valves.

3.11 PIPING SCHEDULE

A. Standard-pressure, wet-type, fire-suppression standpipe piping, NPS 4 and smaller, shall be one of the following:
1. SDR 9 HDPE with fused joints.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for fire-suppression standpipes shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 21 12 13

# FIRE-SUPPRESSION HOSES AND NOZZLES

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of all fire-suppression hoses and nozzles as indicated on the Project Drawings and specified herein.

### 1.02 SUMMARY

A. Section Includes:

1. NPS 1-1/2 by NPS 2-1/2 rack-type hose stations.

B. Related Requirements:

1. Section 21 00 00 "Fire Protection Cabinets" for hose cabinets.
2. Section 21 12 00 "Fire-Suppression Standpipes" for fire hose valves.

### 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.

B. Shop Drawings:

1. Include plans, elevations, sections, and mounting and attachment details.

### 1.04 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each product type to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.01 NPS 1-1/2 BY NPS 2-1/2 RACK-TYPE HOSE STATIONS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. American Fire Hose.
2. Guardian Fire Equipment.
3. North American Fire Hose.

B. Hose Rack:

1. Standard: UL 47.
2. Material: Brass finish.
3. Type: Hose-rack assembly. Include hose valve, reducer adapter, hose rack, water-retention device, hose pins, and hose.
4. Operation: Semiautomatic.
5. Sized to hold fire hose.

C. Hose Valve:

1. Standard: UL 668, NPS 2-1/2, for connecting fire hose.
2. Type: Nonadjustable.
3. Pressure-Control Device: pressure restricting.
4. Hose Valve and Trim Finish: Rough brass or bronze.
5. Pressure Rating: 300 psig minimum.
6. Pattern: Angle.
7. Material: Brass or bronze.
8. Pressure-Control Device: UL 1468, integral or for field installation if indicated.
9. Size: NPS 2-1/2.
10. Inlet: Female pipe threads.
11. Outlet: Male hose threads according to NFPA 1963 and matching local fire-department threads.
12. Reducer Adapter: NPS 2-1/2 by NPS 1-1/2.

D. Hose, double-jacket:

1. Standards: NFPA 1961 and UL 219, lined fire hose with swivel inlet, coupling, gaskets, and nozzle.
2. Size: NPS 1-1/2.
3. Length: 75 feet.
4. Jacket: Combination of natural and synthetic threads or Synthetic thread.
5. Lining: Rubber, plastic, or combination of rubber and plastic compounds.
6. Cover: Rubber, plastic, or combination of rubber and plastic compounds.
7. Nozzle: UL 401 spray nozzle unless plain nozzle is indicated.

a. Material: Brass.
b. Type: Spray, adjustable from shutoff to fog spray or straight stream.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fire hoses, racks, and monitors.

B. Examine roughing-in for standpipe systems to verify actual locations of piping connections before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 HOSE-STATION INSTALLATION

A. Install freestanding hose stations for access and minimum passage restriction.

B. Install NPS 2-1/2 hose connections with quick-disconnect NPS 2-1/2 by NPS 1-1/2 reducer adapter and flow-restricting device unless otherwise indicated.

C. Install cabinet wall-mounted, rack hose stations in cabinets. Include pipe escutcheons, with finish matching valves, inside cabinet where water-supply piping penetrates cabinet. Install valves at angle required for connection of fire hose. Comply with requirements for cabinets in Section 210000 "Fire Protection Cabinets."

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for fire-suppression hoses and nozzles shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 22 05 16

# EXPANSION FITTINGS FOR PIPING

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.02 SUMMARY

A. Section Includes:

1. Flexible-hose expansion joints.
2. Expansion joint anchors.

### 1.03 PERFORMANCE REQUIREMENTS

A. Compatibility: Products shall be suitable for piping service fluids, materials, working pressures, and temperatures.

B. Capability: Products to absorb 200 percent of maximum axial movement between anchors.

### 1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Delegated-Design Submittal: For each anchor and alignment guide indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Anchor Details: Detail fabrication of each anchor indicated. Show dimensions and methods of assembly and attachment to structure.
2. Schedule: Indicate type, manufacturer's number, size, material, pressure rating, end connections, and location for each expansion joint.

### 1.05 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of expansion joint, from manufacturer.

1.06 CLOSEOUT SUBMITTALS

A. Maintenance Data: For expansion joints to include in maintenance manuals.

## PART 2 - PRODUCTS

2.01 EXPANSION JOINTS

A. Flexible-Hose Expansion Joints:

1. Description: Manufactured assembly with flexible-metal-hose in long-radius, 180-degree return bend.
2. Domestic Water Flexible Hose: NSF 61 compliant UV and ozone resistant, rubber tubing, spiral-plied synthetic fabric reinforced.
3. Fire Water Flexible Hose: UV and ozone resistant, synthetic fiber reinforced, SBR rubber tubing with NBR covering and ends fused to inner tubing.
4. Expansion loops for Domestic Piping NPS 2 and Smaller: Stainless-steel fittings with threaded end connections.
   a. Hoses and sheaths with minimum 3 times working pressure in psig, at 70 deg F.
5. Expansion loops for Piping NPS 2-1/2 to NPS 6: Stainless-steel fittings with flanged end connections.
   a. Hoses and sheaths with 275 psig at 70 deg F and 200 psig at 600 deg F ratings.

## PART 3 - EXECUTION

3.01 EXPANSION-JOINT INSTALLATION

A. Install expansion joints of sizes matching sizes of piping in which they are installed.

3.02 ANCHOR INSTALLATION

A. Attach expansion fittings to pipe and secure pipe by attachments to pier structure.

B. Install anchors at locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected pipe.

C. Anchor Attachments:
   1. Anchor Attachment to stainless-Steel and ductile iron Pipe: Attach with pipe hangers and supports.

D. Fabricate and install stainless steel anchors. Comply with ASME B31.9.

1. Anchor Attachment to Steel Structural Members: Attach by bolting.
2. Anchor Attachment to Concrete Structural Members: Attach by fasteners. Follow fastener manufacturer's written instructions.

E. Use grout to form flat bearing surfaces for guides and anchors attached to concrete.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for expansion fittings for piping shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 22 05 23.12

# BALL VALVES FOR PLUMBING PIPING

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of all ball valves for the plumbing piping as indicated on the Project Drawings and specified herein.

### 1.02 SUMMARY

A. Section Includes:

1. Brass ball valves.
2. Bronze ball valves.

### 1.03 DEFINITIONS

A. CWP: Cold working pressure.

### 1.04 ACTION SUBMITTALS

A. Product Data: For each type of valve.

1. Certification that products comply with NSF 61.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads and soldered ends.
3. Set ball valves open to minimize exposure of functional surfaces.

B. Use the following precautions during storage:

1. Maintain valve end protection.
2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

## PART 2 - PRODUCTS

### 2.01 GENERAL REQUIREMENTS FOR VALVES

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:

1. ASME B1.20.1 for threads for threaded end valves.
2. ASME B16.18 for solder-joint connections.
3. ASME B31.9 for building services piping valves.

C. NSF Compliance: NSF 61 for valve materials for potable-water service.

D. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.

E. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

F. Valve Sizes: Same as upstream piping unless otherwise indicated.

G. Valve Actuator Types:

1. Handlever: For quarter-turn valves smaller than NPS 4.

### 2.02 BRASS BALL VALVES

A. One-Piece, Brass Ball Valves:

1. Description:

a. Standard: MSS SP-110.
b. CWP Rating: 400 psig.
c. Body Design: One piece.
d. Body Material: Forged brass or bronze.
e. Ends: Threaded and soldered.
f. Seats: PTFE.
g. Stem: Brass or stainless steel.
h. Ball: Chrome-plated brass or stainless steel.
i. Port: Reduced.

### 2.03 BRONZE BALL VALVES

A. Two-Piece, Bronze Ball Valves with Full Port, and Bronze or Brass Trim:

1. Description:

    a. Standard: MSS SP-110.
    b. CWP Rating: 600 psig.
    c. Body Design: Two piece.
    d. Body Material: Bronze.
    e. Ends: Threaded and soldered.
    f. Seats: PTFE.
    g. Stem: Bronze or brass.
    h. Ball: Chrome-plated brass.
    i. Port: Full.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Do not attempt to repair defective valves; replace with new valves.

### 3.02 VALVE INSTALLATION

A. Install valves with unions at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves in horizontal piping with stem at or above center of pipe.

D. Install valves in position to allow full stem movement.

### 3.03 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.

B. Select valves with the following end connections:

1. NPS 2 and Smaller: Threaded ends.

3.04 DOMESTIC COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
2. Two-piece, brass ball valves with full port and brass trim.
3. Two-piece, bronze ball valves with full port and bronze or brass trim.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for ball valves for plumbing piping shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 22 05 29

# HANGERS AND SUPPORTS FOR PLUMBING PIPING

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of all hangers and support systems for plumbing piping as indicated on the Project Drawings and specified herein.

### 1.02 SUMMARY

A. Section Includes:

1. Metal pipe hangers and supports.
2. Metal framing systems.

B. Related Sections:

1. Section 05 50 00 "Metal and Hardware" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.

### 1.03 DEFINITIONS

A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

### 1.04 PERFORMANCE REQUIREMENTS

A. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. Design seismic-restraint hangers and supports for piping and obtain approval from the Engineer.

### 1.05 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:
   1. Metal framing systems.
   2. Structural Pipe Supports.

## PART 2 - PRODUCTS

### 2.01 METAL PIPE HANGERS AND SUPPORTS

A. 316 Stainless-Steel Pipe Hangers and Supports:

   1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
   2. Hanger Rods: Continuous-thread rod, nuts, and washer made of 316 stainless steel.

### 2.02 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.
      c. Flex-Strut Inc.
      d. Thomas & Betts Corporation.
      e. Unistrut Corporation; Tyco International, Ltd.
      f. Wesanco, Inc.

   2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
   3. Standard: MFMA-4.
   4. Channels: Continuous slotted 316 stainless steel channel with inturned lips.
   5. Channel Nuts: Formed or stamped 316 stainless steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
   6. Hanger Rods: Continuous-thread rod, nuts, and washer made of 316 stainless steel.

2.03 STRUCTURAL PIPING SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural 316 stainless-steel shapes.

2.04 MISCELLANEOUS MATERIALS

A. Structural Stainless Steel: ASTM A 276 and A484, 316 stainless-steel plates, shapes, and bars.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

**PART 3 - EXECUTION**

3.01 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
2. Field fabricate from stainless-steel shapes selected for loads being supported. Weld stainless steel according to AWS D1.6/D1.6M.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

D. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches (100 mm) thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

F. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

G. Install lateral bracing with pipe hangers and supports to prevent swaying.

H. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

## 3.02 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and pipe supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M and AWS D1.6/D1.6M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

## 3.03 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

## 3.04 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).

## 3.05 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment. All piping hangers, supports and hardware shall be 316 stainless steel unless otherwise noted on the drawings. Gangway piping channel supports shall be galvanized steel.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use 316 stainless-steel pipe hangers and supports, and stainless-steel attachments for hostile environment applications.

D. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).
2. Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 (DN 15 to DN 600) if little or no insulation is required.
3. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4 (DN 15 to DN 100), to allow off-center closure for hanger installation before pipe erection.
4. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8 (DN 20 to DN 200).
5. Adjustable, Band Hangers (MSS Type 7 or 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
6. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
7. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8 (DN 10 to DN 200).
8. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3 (DN 10 to DN 80).

9. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).

E. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24 (DN 24 to DN 600).
2. 316 Stainless-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 (DN 20 to DN 600) if longer ends are required for riser clamps.

F. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
2. Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.

G. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for hangers and supports for plumbing piping shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 22 11 16

# DOMESTIC WATER PIPING

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of domestic water piping system as indicated on the Project Drawings and specified herein.

### 1.02 SUMMARY

A. Section Includes:

1. Aboveground domestic water pipes, tubes, and fittings.

### 1.03 INFORMATIONAL SUBMITTALS

A. System purging and disinfecting activities report.

B. Field quality-control reports.

### 1.04 FIELD CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Construction Manager no fewer than two days in advance of proposed interruption of water service.
2. Do not interrupt water service without Construction Manager's written permission.

## PART 2 - PRODUCTS

### 2.01 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.q

B. Potable-water piping and components shall comply with NSF 14 and NSF 61.

### 2.02 HDPE TUBE AND FITTINGS

A. HDPE SDR 9 Tube and fusion fittings.

## PART 3 - EXECUTION

### 3.01 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install shutoff valve, at each domestic water-service connection.

C. Install domestic water piping level without pitch and plumb.

D. Install piping indicated to be exposed at right angles or parallel to deck and walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping to permit valve servicing.

F. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

J. Install escutcheons for piping penetrations of walls, ceilings, and floors.

## 3.02 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

## 3.03 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.

## 3.04 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Piping Inspections:

a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:

1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.

c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

2. Piping Tests:

a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
d. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
f. Prepare reports for tests and for corrective action required.

B. Domestic water piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

## 3.05 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.

    a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
    b. Adjust calibrated balancing valves to flows indicated.

5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.06 CLEANING

A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:

a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
b. Fill and isolate system according to either of the following:

1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.
2) Fill system or part thereof with water/chlorine solution with at least 200 ppm (200 mg/L) of chlorine. Isolate and allow to stand for three hours.

c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
d. Repeat procedures if biological examination shows contamination.
e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.07 VALVE SCHEDULE

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use ball valves for piping NPS 2 and smaller.

B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for domestic water piping shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 05 19

# LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of low-voltage electrical power conductors and cables, connectors, and splices. These equipment and materials are used to establish electrical connections between distribution equipment and any loads that require electrical power. Cable shall comply with UL and type THHN and/or THWN-2.

### 1.02 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Connectors, splices, and terminations rated 600 V and less.

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

### 1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

### 1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

## PART 2 - PRODUCTS

### 2.01 COPPER BUILDING WIRE

A. Available Manufacturers:

1. Alcan Aluminum Corporation; Alcan Cable Div.
2. American Insulated Wire Corp.; a Leviton Company.
3. General Cable Corporation.
4. Senator Wire & Cable Company.
5. Southwire Company.

B. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

D. Conductor Insulation:
1. Type THHN and Type THWN-2: Comply with UL 83.

### 2.02 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated. All splices on the dock shall be submersible type. All connections to bus bars in switchgear, power panels, mini power centers shall be solderless crimp with 2-hole style connectors.

B. Available Manufacturers:

1. AFC Cable Systems, Inc.
2. AMP Incorporated/Tyco International.
3. Hubbell/Anderson.
4. O-Z/Gedney; EGS Electrical Group LLC.
5. 3M Company; Electrical Products Division.

## PART 3 - EXECUTION

### 3.01 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

### 3.02 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.

B. Feeders Concealed in raceway and utility chase: Type THHN/THWN-2, single conductors in raceway.

C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway

D. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

E. Branch Circuits Concealed in flexible conduit: Type THHN/THWN-2, single conductors in raceway.

F. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

### 3.03 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished deck, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

## 3.04 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with marina application and submersible type.

C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.

## 3.05 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

## 3.06 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

## 3.07 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.

2. Perform each of the following visual and electrical tests:

a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
b. Test bolted connections for high resistance using one of the following:

1) A low-resistance ohmmeter.
2) Calibrated torque wrench.
3) Thermographic survey.

c. Inspect compression-applied connectors for correct cable match and indentation.
d. Inspect for correct identification.
e. Inspect cable jacket and condition.
f. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
g. Continuity test on each conductor and cable.
h. Uniform resistance of parallel conductors.

D. Cables will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for low-voltage electrical power conductors and cables shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 05 26

# GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation, and inspection of grounding and bonding materials equipment: conductors, jumper wires, connectors, and grounding electrodes. The new PG&E transformer shall be grounded according to the NEC and other relevant codes. Grounding conductors shall be provided to every load requiring electrical power. Grounding and bonding materials must meet NETA.

### 1.02 SUMMARY

A. Section includes grounding and bonding systems and equipment.

B. Section includes grounding and bonding systems and equipment, plus the following special applications:

1. Underground distribution grounding.
2. Ground bonding common with lightning protection system.
3. Foundation steel electrodes.

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

### 1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans showing dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:

1. Test wells.
2. Ground rods.
3. Grounding arrangements and connections for separately derived systems.

B. Qualification Data: For testing agency and testing agency's field supervisor.

C. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

a. Instructions for periodic testing and inspection of grounding features at test wells based on NETA MTS.

1) Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
2) Include recommended testing intervals.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Certified by NETA.

## PART 2 - PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.02 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches (6.3 by 100 mm) in cross section, with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.03 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression - type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.04 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet.

## PART 3 - EXECUTION

3.01 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.

1. Bury at least 24 inches (600 mm) below grade.
2. Duct-Bank Grounding Conductor: Bury 12 inches (300 mm) above duct bank when indicated as part of duct-bank installation.

C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

D. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

E. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

## 3.02 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

## 3.03 GROUNDING SEPARATELY DERIVED SYSTEMS

A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the equipment grounding conductor and to the frame of the generator.

## 3.04 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches (100 mm) will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches (50 mm) above to 6 inches (150 mm) below concrete. Seal floor opening with waterproof, nonshrink grout.

## 3.05 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Flexible raceway runs.
5. Armored and metal-clad cable runs.
6. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

C. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

D. Metallic Fences: Comply with requirements of IEEE C2.

1. Grounding Conductor: Bare copper, not less than No. 8 AWG.
2. Gates: Shall be bonded to the grounding conductor with a flexible bonding jumper.
3. Barbed Wire: Strands shall be bonded to the grounding conductor.

## 3.06 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
2. Use exothermic welds for all below-grade connections.
3. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Shall be at least 12 inches (300 mm) deep, with cover.

1. Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

G. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4 AWG.

1. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

## 3.07 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections with the assistance of a factory-authorized service representative.

D. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal. Make tests at ground rods before any conductors are connected.

    a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    b. Perform tests by fall-of-potential method according to IEEE 81.

4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

E. Grounding system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

G. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power Distribution Units or Panelboards Serving Electronic Equipment: 1 ohm(s).
3. Substations and Pad-Mounted Equipment: 5 ohms.
4. Manhole Grounds: 10 ohms.

H. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify promptly and include recommendations to reduce ground resistance.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for grounding and bonding for electrical systems shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 05 29

# HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of conduit and cable support devices, mounting, anchoring, and other attachment components to secure electrical raceway to surfaces including such as the underside of aluminum gangway and dock walkways.

### 1.02 SUMMARY

A. Section Includes:
   1. Conduit and cable support devices.
   2. Support for conductors in vertical conduit.
   3. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.

B. Related Requirements:

   1. Products and installation requirements necessary for compliance with seismic and marina environment criteria.

### 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 the following:

      a. Slotted support systems, hardware, and accessories.
      b. Clamps.
      c. Hangers.
      d. Sockets.
      e. Eye nuts.
      f. Fasteners.
      g. Anchors.
      h. Saddles.

i. Brackets.

2. Include rated capacities and furnished specialties and accessories.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. For fabrication and installation details for electrical hangers and support systems.

1. Hangers. Include product data for components.
2. Slotted support systems.
3. Equipment supports.
4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

1.04 INFORMATIONAL SUBMITTALS

Welding certificates.

1.05 QUALITY ASSURANCE

Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M.

**PART 2 - PRODUCTS**

2.01 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

1. Manufacturers:
   a. Alli3d Tubing
   b. Cooper Industries
   c. Unistrut
   d. Or Approved Equal

A. Standard: Comply with stainless steel components for field assembly.

B. Conduit and Cable Support Devices: Stainless steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of stainless steel.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; stainless steel.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Stainless steel fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used. Allowed Manufacturers are:

   a. Hilti, Inc

   b. OZ Gedney

   c. Or Approved Equal

2. Mechanical-Expansion Anchors: Insert-wedge-type, steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used. Allowed Manufacturers are:

   a. Cooper B-Line

   b. Hilti, Inc

   c. Or Approved Equal

3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-stainless steel springhead type.
7. Hanger Rods: Threaded stainless steel.

## 2.02 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

## PART 3 - EXECUTION

### 3.01 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
   1. NECA 101

B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.

D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with stainless steel slotted support system, sized so capacity can be increased by at least 30 percent in future without exceeding specified design load limits.

   1. Secure raceways and cables to these supports with two-bolt conduit clamps.

### 3.02 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

   1. To Wood: Fasten with lag stainless steel screws or through bolts.
   2. To New Concrete: Bolt to concrete inserts.
   3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
   4. To Existing Concrete: Expansion anchor fasteners.
   5. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
   6. To Light Steel: Sheet metal screws.

7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.03 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS D1.1/D1.1M.

3.04 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Anchor equipment to concrete base as follows:

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

**PART 4 - MEASUREMENT AND PAYMENT**

Full compensation for hangers and supports for electrical systems shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 05 33

# RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of conduits, fittings, pull boxes, junction boxes, enclosures, cabinets, and solutions to facilitate the pulling of electrical cable through conduits. Conduit shall be provided to enclose and protect electrical cables used for whole electrical distribution system. Electrical raceway and boxes will shall be corrosive-resistant due to marine environment.

### 1.02 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Nonmetal wireways and auxiliary gutters.
5. Surface raceways.
6. Boxes, enclosures, and cabinets.
7. Handholes and boxes for exterior underground cabling.

### 1.03 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel conduit.

C. IMC: Intermediate metal conduit.

### 1.04 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.05 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Data: Certificates, for enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.

D. Source quality-control reports.

## PART 2 - PRODUCTS

2.01 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

B. Available Manufacturers:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Anamet Electrical, Inc.; Anaconda Metal Hose.
4. Electri-Flex Co.
5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
6. LTV Steel Tubular Products Company.
7. Manhattan/CDT/Cole-Flex.

8. O-Z Gedney; Unit of General Signal.
9. Wheatland Tube Co.

C. Rigid Steel Conduit: ANSI C80.1.

D. Aluminum Rigid Conduit: ANSI C80.5.

E. IMC: ANSI C80.6.

F. Fittings: NEMA FB 1; compatible with conduit and tubing materials.
1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. GRC: Comply with ANSI C80.1 and UL 6.
3. ARC: Comply with ANSI C80.5 and UL 6A.
4. IMC: Comply with ANSI C80.6 and UL 1242.

    a. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit. Comply with NEMA RN 1.
    b. Coating Thickness: 0.040 inch (1 mm), minimum.

5. EMT: Comply with ANSI C80.3 and UL 797.
6. FMC: Comply with UL 1; zinc-coated steel.
7. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

G. Metal Fittings:
1. Comply with NEMA FB 1 and UL 514B.
2. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
3. Fittings for EMT:

    a. Material: Steel.
    b. Type: Setscrew.

4. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
5. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

H. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.02 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

B. Available Manufacturers:
1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. ENT: Comply with NEMA TC 13 and UL 1653.
3. RNC: Type EPC-80-PVC complying with NEMA TC 2 and UL 651 unless otherwise indicated.
4. LFNC: Comply with UL 1660.
5. Rigid HDPE: Comply with UL 651A.
6. Continuous HDPE: Comply with UL 651A.
7. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.
8. RTRC: Comply with UL 2515A and NEMA TC 14.
9. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

    a. Fittings for LFNC: Comply with UL 514B.

C. Solvents and Adhesives: As recommended by conduit manufacturer. Available Manufacturers:

1. Hoffman.
2. Lamson & Sessions; Carlon Electrical Products.

3. Available Manufacturers:

    a. Airey-Thompson Sentinel Lighting; Wiremold Company (The).
    b. Thomas & Betts Corporation.
    c. Walker Systems, Inc.; Wiremold Company (The).
    d. Wiremold Company (The); Electrical Sales Division.

D. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.03 BOXES, ENCLOSURES, AND CABINETS

A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

E. Metal Floor Boxes:

1. Material: sheet metal.
2. Type: Fully adjustable.
3. Shape: Rectangular.
4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

F. Nonmetallic Floor Boxes: Nonadjustable.

1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.

H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

J. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

## PART 3 - EXECUTION

### 3.01 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: IMC.
2. Concealed Conduit, Aboveground: IMC.
3. Underground Conduit: RNC.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.

5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMTRNC.

2. Concealed in Ceilings and Interior Walls and Partitions: EMT ENT or RNC.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
4. Damp or Wet Locations: GRC.
5. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size:3/4-inch (21-mm) trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3.

E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

G. Install surface raceways only where indicated on Drawings.

H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F (49 deg C).

## 3.02 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Arrange stub-ups so curved portions of bends are not visible above finished slab.

E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.

F. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

G. Support conduit within 12 inches (300 mm)of enclosures to which attached.

H. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Arrange raceways to keep a minimum of 1 inch (25 mm) 2 inches (50 mm) of concrete cover in all directions.
4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
5. Change from ENT to IMC before rising above floor.

I. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, or RMC for raceways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

P. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

R. Surface Raceways:

1. Install surface raceway with a minimum 2-inch (50-mm) radius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

S. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

T. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Where otherwise required by NFPA 70.

U. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

V. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F (17 deg C) and that has straight-run length that exceeds 25 feet (7.6 m). Install in each run of aboveground RMC conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet (30 m).
   a.
2. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.
3. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
4. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

W. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

X. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to top of box unless otherwise indicated.

Y. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

Z. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

AA. Locate boxes so that cover or plate will not span different building finishes.

BB. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

CC. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

DD. Set metal floor boxes level and flush with finished floor surface.

EE. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

## 3.03 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches (150 mm) in nominal diameter.
2. Install backfill as specified in Section 312000 "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete for a minimum of 12 inches (300 mm) on each side of the coupling.
    b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

6. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried conduits but a minimum of 6 inches (150 mm) below grade. Align planks along centerline of conduit.
7. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

## 3.04 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch (25 mm) above finished grade.

D. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.

E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

## 3.05 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

## 3.06 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

## 3.07 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for raceways and boxes for electrical systems shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 05 43

# UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of underground raceways and related equipment for all underground conduit applications such as the feed from the new PG&E transformer to the new electrical switchboard.

### 1.02 SUMMARY

A. Section Includes:

1. Metal conduits and fittings, including GRC and PVC-coated steel conduit.
2. Rigid nonmetallic duct.
3. Flexible nonmetallic duct.
4. Duct accessories.
5. Precast manholes.
6. Utility structure accessories.

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include accessories for manholes, handholes, boxes, and other utility structures.
   2. Include underground-line warning tape.

B. Shop Drawings:

   1. Precast or Factory-Fabricated Underground Utility Structures:

      a. Include plans, elevations, sections, details, attachments to other work, and accessories.
      b. Include grounding details.

1.04 FIELD CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions, and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Construction Manager no fewer than two days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Construction Manager's written permission.

B. Ground Water: Assume ground-water level is at grade level unless a lower water table is noted on Drawings.

## PART 2 - PRODUCTS

2.01 METAL CONDUIT AND FITTINGS

A. GRC: Comply with ANSI C80.1 and UL 6.

B. Coated Steel Conduit: PVC-coated GRC.

1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch (1 mm), minimum.

C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

2.02 RIGID NONMETALLIC DUCT

A. Underground Plastic Utilities Duct: Type EPC-80-PVC and Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.

B. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

C. Solvents and Adhesives: As recommended by conduit manufacturer.

## 2.03 DUCT ACCESSORIES

A. Duct Spacers: Factory-fabricated, rigid, PVC interlocking spacers; sized for type and size of duct with which used, and selected to provide minimum duct spacing indicated while supporting duct during concreting or backfilling.

B. Underground-Line Warning Tape: Comply with requirements for underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

C. Concrete Warning Planks: Nominal 12 by 24 by 3 inches (300 by 600 by 75 mm) in size, manufactured from 6000-psi (41-MPa) concrete.

1. Color: Red dye added to concrete during batching.
2. Mark each plank with "ELECTRIC" in 2-inch- (50-mm-) high, 3/8-inch-(10-mm-) deep letters.

## 2.04 PRECAST PULLBOX

A. Description: One-piece units and units with interlocking mating sections, complete with accessories, hardware, and features.

B. Comply with ASTM C 858.

C. Structural Design Loading: Comply with requirements in "Underground Enclosure Application" Article.

D. Knockout Panels: Precast openings in walls, arranged to match dimensions and elevations of approaching duct, plus an additional 12 inches (300 mm) vertically and horizontally to accommodate alignment variations.

1. Splayed location.
2. Knockout panels shall be located no less than 6 inches (150 mm) from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
3. Knockout panel opening shall have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct.
4. Knockout panel shall be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.
5. Knockout panels shall be 1-1/2 to 2 inches (38 to 50 mm) thick.

E. Duct Entrances in Manhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

1. Type and size shall match fittings to duct to be terminated.

2. Fittings shall align with elevations of approaching duct and be located near interior corners of manholes to facilitate racking of cable.

F. Ground Rod Sleeve: Provide a 3-inch (75-mm) PVC sleeve in pullbox floors 2 inches (50 mm) from the wall adjacent to, but not underneath, the duct entering the structure.

## PART 3 - EXECUTION

### 3.01 PREPARATION

A. Coordinate layout and installation of duct, duct bank, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.

### 3.02 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES, AND BOXES

A. Precast Concrete Handhole and Manhole Installation:

1. Comply with ASTM C 891 unless otherwise indicated.
2. Install units' level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances.
3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch (25-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

B. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.

C. Manhole Access: Circular opening in manhole roof; sized to match cover size.

1. Manholes with Fixed Ladders: Offset access opening from manhole centerlines to align with ladder.
2. Install chimney, constructed of precast concrete collars and rings, to support cast-iron frame to connect cover with manhole roof opening. Provide moisture-tight masonry joints and waterproof grouting for frame to chimney.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for underground ducts and raceways for electrical systems shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 05 53

# IDENTIFICATION FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of labeling materials, laminations, bands, preprinted tubes, tapes, stencils, and cable ties. These materials shall be used to clearly identify electrical equipment, raceways, and low-voltage cables by their attributes and sources of power.

### 1.02 SUMMARY

A. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Bands and tubes.
4. Tapes and stencils.
5. Tags.
6. Signs.
7. Cable ties.
8. Paint for identification.
9. Fasteners for labels and signs.

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels.

## PART 2 - PRODUCTS

### 2.01 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Comply with NFPA 70E requirements for arc-flash warning labels.

F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

### 2.02 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:

1. Black letters.
2. Legend: Indicate voltage and system.

B. Raceways and Cables Carrying Circuits at More Than 600 V:

1. Black letters on an orange field.
2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."

C. Warning Label Colors:

1. Identify system voltage with black letters on an orange background.

### 2.03 LABELS

A. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil- (0.08-mm-) thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

## 2.04 BANDS AND TUBES

A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameters sized to suit diameters and that stay in place by gripping action.

B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameter and shrunk to fit firmly. Full shrink recovery occurs at a maximum of 200 deg F (93 deg C). Comply with UL 224.

## 2.05 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide; compounded for outdoor use.

C. Tape and Stencil: 4-inch- (100-mm-) wide black stripes on 10-inch (250-mm) centers placed diagonally over orange background and are 12 inches (300 mm) wide. Stop stripes at legends.

D. Underground-Line Warning Tape:
   1. Tape:
      a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
      b. Printing on tape shall be permanent and shall not be damaged by burial operations.
      c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
   2. Color and Printing:
      a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.

## 2.06 CABLE TIES

A. General-Purpose Cable Ties: Self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 Deg F (23 Deg C) according to ASTM D 638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black, except where used for color-coding.

## PART 3 - EXECUTION

### 3.01 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

### 3.02 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Wraparound Labels: Secure tight to surface at a location with high visibility and accessibility.

E. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.

F. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.

G. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

H. Underground Line Warning Tape:
1. Limit use of underground-line warning tape to direct-buried cables.

2. Install underground-line warning tape for direct-buried cables and cables in raceways.

I. Write-on Tags:

1. Place in a location with high visibility and accessibility.

J. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

K. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

## 3.03 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil. Stencil legend "DANGER - CONCEALED HIGH-VOLTAGE WIRING" with 3-inch- (75-mm-) high, black letters on 20-inch (500-mm) centers.

C. Accessible Raceways, Armored and Metal-Clad Cables, More Than 600 V: Self-adhesive labels.

D. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive vinyl tape applied in bands.

E. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive labels containing the wiring system legend and system voltage. System legends shall be as follows:
1. "POWER."

F. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use **color**-coding bands to identify the phase.

G. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive labels with the conductor or cable designation, origin, and destination.

H. Workspace Indication: Apply tape and stencil to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

I. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.

J. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels.

1. Apply to exterior of door, cover, or other access.
2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:

a. Power-transfer switches.
b. Controls with external control power connections.

K. Arc Flash Warning Labeling: Self-adhesive labels.

L. Equipment Identification Labels:
1. Equipment to Be Labeled:

a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a laminated acrylic or melamine label.
b. Switchboards.
c. Transformers: Label that includes tag designation indicated on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
d. Enclosed switches.
e. Enclosed circuit breakers.
f. Contactors.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for identification for electrical systems shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 24 13

# SWITCHBOARDS

## PART 1 - GENERAL

1.01 SCOPE

A. This section includes specifications for fabrication, installation, and inspection of switchboards, disconnecting and overcurrent protective devices, accessory components and features, and identification. A new electrical switchboard shall be provided to distribute electrical power to all loads in the project. Switchboard shall withstand the possible fault current.

1.02 SUMMARY

A. Section Includes:

1. Service and distribution switchboards rated 600 V and less.
2. Disconnecting and overcurrent protective devices.
3. Instrumentation.
4. Control power.
5. Accessory components and features.
6. Identification.
7. Mimic bus.

B. Related Requirements

1. Provide "Arc-Flash Hazard Analysis" for arc-flash analysis and arc-flash label requirements.

1.03 ACTION SUBMITTALS

A. Product Data: For each switchboard, overcurrent protective device, ground-fault protector, accessory, and component.

1. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

B. Shop Drawings: For each switchboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
2. Detail enclosure types for types NEMA 250, Type 3R.
3. Detail bus configuration, current, and voltage ratings.
4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
5. Include descriptive documentation of optional barriers specified for electrical insulation and isolation.
6. Detail utility company's metering provisions with indication of approval by utility company.
7. Include evidence of NRTL listing for series rating of installed devices.
8. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
9. Include time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.
10. Include diagram and details of proposed mimic bus.
11. Include schematic and wiring diagrams for power, signal, and control wiring.

C. Samples: Representative portion of mimic bus with specified material and finish, for color selection.

D. Delegated Design Submittal:
   1. For arc-flash labels.

## 1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Seismic Qualification Data: Certificates, for switchboards, overcurrent protective devices, accessories, and components, from manufacturer.

   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Field Quality-Control Reports:

   1. Test procedures used.

## 1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For switchboards and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Routine maintenance requirements for switchboards and all installed components.
b. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
c. Time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

## 1.06 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers qualified as defined in NEMA PB 2.1 and trained in electrical safety as required by NFPA 70E.

B. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

## 1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.

B. Remove loose packing and flammable materials from inside switchboards and connect factory-installed space heaters to temporary electrical service to prevent condensation.

C. Handle and prepare switchboards for installation according to NEMA PB 2.1.

## 1.08 FIELD CONDITIONS

A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.

B. Environmental Limitations:

1. Do not deliver or install switchboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above switchboards is complete, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

    a. Ambient Temperature: Not exceeding 104 deg F (40 deg C).
    b. Altitude: Not exceeding 6600 feet (2000 m).

C. Unusual Service Conditions: NEMA PB 2, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet (2000 m).

D. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Owner no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without Owner's written permission.
4. Comply with NFPA 70E.

## 1.09 COORDINATION

A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

## 1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace switchboard enclosures, buswork, overcurrent protective devices, accessories, and factory

installed interconnection wiring that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion.

B. Manufacturer's Warranty: Manufacturer's agrees to repair or replace surge protection devices that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.01 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Switchboards shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation. Shake-table testing shall comply with ICC-ES AC156.
2. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

### 2.02 SWITCHBOARDS

A. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Comply with NEMA PB 2.

E. Comply with NFPA 70.

F. Comply with UL 891.

G. Front-Connected, Front-Accessible Switchboards:

1. Main Devices: Panel mounted.
2. Branch Devices: Panel mounted.
3. Sections front and rear aligned.

H. Front- and Side-Accessible Switchboards:

1. Main Devices: Fixed, individually mounted.
2. Branch Devices: Panel mounted.
3. Section Alignment: Front aligned.

I. Front- and Rear-Accessible Switchboards:

1. Main Devices: Fixed, individually mounted.
2. Branch Devices: Panel mounted.
3. Sections front and rear aligned.

J. Nominal System Voltage: 480Y/277 V.

K. Main-Bus Continuous: 800 A.

L. Seismic Requirements: Fabricate and test switchboards according to IEEE 344 to withstand seismic forces.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation. Shake-table testing shall comply with ICC-ES AC156.

a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

M. Indoor Enclosures: Steel, NEMA 250, Type 1.

N. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface.

O. Outdoor Enclosures: Type 3R.

1. Finish: Factory-applied finish in manufacturer's standard color; undersurfaces treated with corrosion-resistant undercoating.
2. Enclosure: Downward, rearward sloping roof; bolt-on rear covers for each section, with provisions for padlocking.
3. Doors: Personnel door at each end of aisle, minimum width of 30 inches (762 mm); opening outwards; with panic hardware and provisions for padlocking. At least one door shall be sized to permit the largest single switchboard section to pass through without disassembling doors, hinges, or switchboard section.

4. Accessories: LED luminaires, ceiling mounted; wired to a three-way light switch at each end of aisle; ground-fault circuit interrupter (GFCI) duplex receptacle; emergency battery pack luminaire installed on wall of aisle midway between personnel doors.

5. Power for Space Heaters, Ventilation, Lighting, and Receptacle: Include a control-power transformer, with spare capacity of 25 percent, within the switchboard. Supply voltage shall be 120 V ac.
6. Power for space heaters, ventilation, lighting, and receptacle provided by a remote source.

P. Barriers: Between adjacent switchboard sections.

Q. Insulation and isolation for main bus of main section and main and vertical buses of feeder sections.

R. Space Heaters: Factory-installed electric space heaters of sufficient wattage in each vertical section to maintain enclosure temperature above expected dew point.

1. Space-Heater Control: Thermostats to maintain temperature of each section above expected dew point.
2. Space-Heater Power Source: Transformer, factory installed in switchboard.

S. Service Entrance Rating: Switchboards intended for use as service entrance equipment shall contain from one to six service disconnecting means with overcurrent protection, a neutral bus with disconnecting link, a grounding electrode conductor terminal, and a main bonding jumper.

T. Utility Metering Compartment: Barrier compartment and section complying with utility company's requirements; hinged sealable door; buses provisioned for mounting utility company's current transformers and potential transformers or potential taps as required by utility company. If separate vertical section is required for utility metering, match and align with basic switchboard. Provide service entrance label and necessary applicable service entrance features.

U. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.

V. Removable, Hinged Rear Doors and Compartment Covers: Secured by standard bolts, for access to rear interior of switchboard.

W. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.

X. Buses and Connections: Three phase, four wire unless otherwise indicated.

1. Provide phase bus arrangement A, B, C from front to back, top to bottom, and left to right when viewed from the front of the switchboard.
2. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity, silver-plated.
3. Phase- and Neutral-Bus Material: Tin-plated, high-strength, electrical-grade aluminum alloy with tin-plated aluminum circuit-breaker line connections.
4. Copper feeder circuit-breaker line connections.
5. Tin-plated aluminum feeder circuit-breaker line connections.
6. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with mechanical compression connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
7. Ground Bus: 1/4-by-2-inch- (6-by-50-mm-) Minimum-size required by UL 891, hard-drawn copper of 98 percent conductivity, equipped with mechanical compression connectors for feeder and branch-circuit ground conductors.
8. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
9. Disconnect Links:

    a. Isolate neutral bus from incoming neutral conductors.
    b. Bond neutral bus to equipment-ground bus for switchboards utilized as service equipment or separately derived systems.

10. Neutral Buses: 50 percent of the ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
11. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
12. Isolation Barrier Access Provisions: Permit checking of bus-bolt tightness.

Y. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.

Z. Bus-Bar Insulation: Factory-applied, flame-retardant, tape wrapping of individual bus bars or flame-retardant, spray-applied insulation. Minimum insulation temperature rating of 105 deg C.

AA. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components including instruments and instrument transformers.

## 2.03 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long and short time adjustments.
    d. Ground-fault pickup level, time delay, and I squared t response.

4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
5. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker; trip activation on fuse opening or on opening of fuse compartment door.
6. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
7. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
8. MCCB Features and Accessories:

    a. Standard frame sizes, trip ratings, and number of poles.
    b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
    c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
    d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
    e. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
    f. Communication Capability: Circuit-breaker-mounted communication module with functions and features compatible with power monitoring and control system specified in Section 260913 "Electrical Power Monitoring and Control."

g. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
h. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
i. Auxiliary Contacts: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
j. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.

B. Insulated-Case Circuit Breaker (ICCB): 100 percent rated, sealed, insulated-case power circuit breaker with interrupting capacity rating to meet available fault current.

1. Fixed circuit-breaker mounting.
2. Two-step, stored-energy closing.
3. Full-function, microprocessor-based trip units with interchangeable rating plug, trip indicators, and the following field-adjustable settings:

a. Instantaneous trip.
b. Time adjustments for long- and short-time pickup.
c. Ground-fault pickup level, time delay, and I squared t response.

4. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
5. Remote trip indication and control.
6. Communication Capability: Web enabled integral Ethernet communication module and embedded Web server with factory-configured Web pages (HTML file format). Provide functions and features compatible with power monitoring and control system specified in Section 260913 "Electrical Power Monitoring and Control."
7. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
8. Control Voltage: 120-V ac.

## 2.04 ACCESSORY COMPONENTS AND FEATURES

A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

2.05 IDENTIFICATION

A. Mimic Bus: Entire single-line switchboard bus work, as depicted on factory record drawing, on a photoengraved nameplate.

1. Nameplate: At least 0.032-inch- (0.813-mm-) thick anodized aluminum, located at eye level on front cover of the switchboard incoming service section.

B. Service Equipment Label: NRTL labeled for use as service equipment for switchboards with one or more service disconnecting and overcurrent protective devices.

## PART 3 - EXECUTION

3.01 EXAMINATION

A. Receive, inspect, handle, and store switchboards according to NECA 400.

1. Lift or move panelboards with spreader bars and manufacturer-supplied lifting straps following manufacturer's instructions.
2. Use rollers, slings, or other manufacturer-approved methods if lifting straps are not furnished.
3. Protect from moisture, dust, dirt, and debris during storage and installation.
4. Install temporary heating during storage per manufacturer's instructions.

B. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically damaged.

C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance of the Work or that affect the performance of the equipment.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install switchboards and accessories according to NECA 400.

B. Equipment Mounting: Install switchboards on concrete base, 4-inch (100-mm) nominal thickness. Comply with requirements for concrete base specified in Section 033000 "Cast-in-Place Concrete."

1. Install conduits entering underneath the switchboard, entering under the vertical section where the conductors will terminate. Install with couplings flush with the concrete base. Extend 2 inches (50-mm) above concrete base after switchboard is anchored in place.
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.
3. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to switchboards.
6. Anchor switchboard to building structure at the top of the switchboard if required or recommended by the manufacturer.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, straps and brackets, and temporary blocking of moving parts from switchboard units and components.

D. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.

E. Install filler plates in unused spaces of panel-mounted sections.

F. Install overcurrent protective devices, surge protection devices, and instrumentation.

1. Set field-adjustable switches and circuit-breaker trip ranges.

G. Install spare-fuse cabinet.

H. Comply with NECA 1.

## 3.03 CONNECTIONS

A. Bond conduits entering underneath the switchboard to the equipment ground bus with a bonding conductor sized per NFPA 70.

B. Support and secure conductors within the switchboard according to NFPA 70.

C. Extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.

## 3.04 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

## 3.05 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

D. Tests and Inspections:

1. Acceptance Testing:

    a. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit. Open control and metering circuits within the switchboard, and remove neutral connection to surge protection and other electronic devices prior to insulation test. Reconnect after test.
    b. Test continuity of each circuit.

2. Test ground-fault protection of equipment for service equipment per NFPA 70.
3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
4. Correct malfunctioning units on-site where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
5. Perform the following infrared scan tests and inspections, and prepare reports:

a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front and rear panels so joints and connections are accessible to portable scanner.
b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switchboard 11 months after date of Substantial Completion.
c. Instruments and Equipment:

1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

6. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

E. Switchboard will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.06 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as indicated.

3.07 PROTECTION

A. Temporary Heating: Apply temporary heat, to maintain temperature according to manufacturer's written instructions, until switchboard is ready to be energized and placed into service.

3.08 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain switchboards, overcurrent protective devices, instrumentation, and accessories.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for switchboards shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 24 16

# PANELBOARDS

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of electrical panelboards, disconnecting and overcurrent protective devices, identification, and accessory components and features. Panelboards shall be packaged together along with transformers in a power center for further distribution of power to pedestals, light fixtures, and other loads.

### 1.02 SUMMARY

A. Section Includes:

1. Distribution panelboards.
2. Lighting and appliance branch-circuit panelboards.

### 1.03 DEFINITIONS

A. ATS: Acceptance testing specification.

B. GFCI: Ground-fault circuit interrupter.

C. GFEP: Ground-fault equipment protection.

D. MCCB: Molded-case circuit breaker.

E. SPD: Surge protective device.

F. VPR: Voltage protection rating.

### 1.04 ACTION SUBMITTALS

A. Product Data: For each type of panelboard.

1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.

2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details.
2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
4. Detail bus configuration, current, and voltage ratings.
5. Short-circuit current rating of panelboards and overcurrent protective devices.
6. Include evidence of NRTL listing for series rating of installed devices.
7. Include evidence of NRTL listing for SPD as installed in panelboard.
8. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
9. Include wiring diagrams for power, signal, and control wiring.
10. Key interlock scheme drawing and sequence of operations.
11. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device. Include an Internet link for electronic access to downloadable PDF of the coordination curves.

## 1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

## 1.06 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

## 1.07 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Keys: Two spares for each type of panelboard cabinet lock.
2. Circuit Breakers Including GFCI and GFEP Types: Two spares for each panelboard.

## 1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: ISO 9001 certified.

## 1.09 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.

B. Handle and prepare panelboards for installation according to NECA 407.

## 1.10 FIELD CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

a. Ambient Temperature: Not exceeding minus 22 deg F (minus 30 deg C) to plus 104 deg F (plus 40 deg C).
b. Altitude: Not exceeding 6600 feet (2000 m).

B. Service Conditions: NEMA 3R, usual service conditions, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet (2000 m).

C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Construction Manager no fewer than two days in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Construction Manager's written permission.
3. Comply with NFPA 70E.

1.11 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.

1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace SPD that fails in materials or workmanship within specified warranty period.

1. SPD Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

2.01 PANELBOARD REQUIREMENTS

A. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA PB 1.

D. Comply with NFPA 70.

E. Enclosures: Flush and Surface-mounted, dead-front cabinets with padlock.

1. Rated for environmental conditions at installed location.
   a. Outdoor Locations: NEMA 250, Type 3R.
   b. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

2. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12Height: 84 inches (2.13 m) maximum.

3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
4. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
5. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
6. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
7. Finishes:

    a. Panels and Trim: Steel and galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
    b. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.

8. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.

F. Incoming Mains:

1. Location: Bottom Main Breaker: Main lug interiors up to 400 amperes shall be field convertible to main breaker.

G. Phase, Neutral, and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.

    a. Plating shall run entire length of bus.
    b. Bus shall be fully rated the entire length.

2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
4. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box.
5. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.

6. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and listed and labeled by an NRTL acceptable to authority having jurisdiction, as suitable for nonlinear loads in electronic-grade panelboards and others designated on Drawings. Connectors shall be sized for double-sized or parallel conductors as indicated on Drawings. Do not mount neutral bus in gutter.
7. Split Bus: Vertical buses divided into individual vertical sections.

H. Conductor Connectors: Suitable for use with conductor material.

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Terminations shall allow use of 75 deg C rated conductors without derating.
3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
4. Main and Neutral Lugs: Compression type, with a lug on the neutral bar for each pole in the panelboard.
5. Ground Lugs and Bus-Configured Terminators: Compression type, with a lug on the bar for each pole in the panelboard.
6. Feed-Through Lugs: Compression type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
7. Subfeed (Double) Lugs: Compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
8. Gutter-Tap Lugs: Compression type suitable for use with conductor material and with matching insulating covers. Locate at same end of bus as incoming lugs or main device.
9. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.

I. NRTL Label: Panelboards or load centers shall be labeled by an NRTL acceptable to authority having jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards or load centers shall have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.

J. Future Devices: Panelboards or load centers shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

1. Percentage of Future Space Capacity: Five percent.

K. Panelboard Short-Circuit Current Rating: Rated for series-connected system with integral or remote upstream overcurrent protective devices and labeled by an NRTL. Include label or manual with size and type of allowable upstream and

branch devices listed and labeled by an NRTL for series-connected short-circuit rating.

1. Panelboards rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
2. Panelboards rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

## 2.02 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

B. Surge Suppression: Factory installed as an integral part of indicated panelboards, complying with UL 1449 SPD Type 1.

## 2.03 POWER PANELBOARDS

A. Manufacturer:

1. Eaton.

2. General Electrical Company.

3. Square D.

B. Panelboards: NEMA PB 1, distribution type.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

1. For doors more than 36 inches (914 mm) high, provide two latches, keyed alike.

D. Mains: Circuit breaker.

E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers .

F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

G. Branch Overcurrent Protective Devices: Fused switches.

H. Contactors in Main Bus: NEMA ICS 2, Class A, electrically held, general-purpose controller, with same short-circuit interrupting rating as panelboard.

1. Internal Control-Power Source: Control-power transformer, with fused primary and secondary terminals, connected to main bus ahead of contactor connection.
2. External Control-Power Source: 120-V branch circuit.

## 2.04 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

B. Mains: Circuit breaker.

C. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

D. Contactors in Main Bus: NEMA ICS 2, Class A, electrically held, general-purpose controller, with same short-circuit interrupting rating as panelboard.

1. Internal Control-Power Source: Control-power transformer, with fused primary and secondary terminals, connected to main bus ahead of contactor connection.
2. External Control-Power Source: 120-V branch circuit.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

F. Doors: Door-in-door construction with concealed hinges; secured with multipoint latch with tumbler lock; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed.

## 2.05 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers:

a. Inverse time-current element for low-level overloads.
b. Instantaneous magnetic trip element for short circuits.
c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
4. MCCB Features and Accessories:

    a. Standard frame sizes, trip ratings, and number of poles.
    b. Lugs: Compression style, suitable for number, size, trip ratings, and conductor materials.
    c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.
    d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
    e. For "Shunt Trip" Subparagraph below, 120-V units trip at 55 percent or more of rated voltage; all other voltages trip at 75 percent or more of rated voltage.
    f. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.
    g. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
    h. Multipole units enclosed in a single housing with a single handle to operate as a single unit.

B. Fused Switch: NEMA KS 1, Type HD; clips to accommodate specified fuses; lockable handle.

    1. Fuses and Spare-Fuse Cabinet: Comply with requirements specified in Section 262813 "Fuses."

## 2.06 IDENTIFICATION

A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.

B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.

C. Circuit Directory: Directory card inside panelboard door, mounted in transparent card holder.

    1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

2.07 ACCESSORY COMPONENTS AND FEATURES

A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

B. Portable Test Set: For testing functions of solid-state trip devices without removing from panelboard. Include relay and meter test plugs suitable for testing panelboard meters and switchboard class relays.

## PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.

B. Receive, inspect, handle, and store panelboards according to NECA 407.

C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.

D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Comply with NECA 1.

C. Install panelboards and accessories according to NECA 407.

D. Comply with mounting and anchoring requirements per manufacturer recommendation.

E. Mount top of trim 90 inches (2286 mm) above finished floor unless otherwise indicated.

F. Mount panelboard cabinet plumb and rigid without distortion of box.

G. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

H. Mount surface-mounted panelboards to steel slotted supports 5/8 inch (16 mm) in depth. Orient steel slotted supports vertically.

I. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable, circuit-breaker trip ranges.

J. Install filler plates in unused spaces.

K. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

L. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

M. Mount spare fuse cabinet in accessible location.

## 3.03 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

## 3.04 FIELD QUALITY CONTROL

A. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test for low-voltage air circuit breakers stated in NETA ATS, Paragraph 7.6 Circuit Breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Perform the following infrared scan tests and inspections and prepare reports:

a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.
c. Instruments and Equipment:

1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

C. Panelboards will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

## 3.05 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

B. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes. Prior to making circuit changes to achieve load balancing, inform Architect of effect on phase color coding.

1. Measure loads during period of normal facility operations.
2. Perform circuit changes to achieve load balancing outside normal facility operation schedule or at times directed by the Architect. Avoid disrupting services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.

3. After changing circuits to achieve load balancing, recheck loads during normal facility operations. Record load readings before and after changing circuits to achieve load balancing.
4. Tolerance: Maximum difference between phase loads, within a panelboard, shall not exceed 20 percent.

3.06 PROTECTION

A. Temporary Heating: Prior to energizing panelboards, apply temporary heat to maintain temperature according to manufacturer's written instructions.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for panelboards shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 26 00

# POWER CENTER SUBSTATION

## PART 1 - GENERAL

### 1.01 SCOPE

A. This section includes specifications for fabrication, installation and inspection of power center substations and the individual components: transformers, panelboards, overcurrent protection devices, cooling fans, and surge protection devices. Power centers serve power pedestals at each dock, and shall meet NEMA 3R for marine environment. Power centers additionally serve light fixtures and RUMs.

### 1.02 SUMMARY

A. Section includes freestanding, prepackaged power distribution units for transforming, and distributing electrical power.

### 1.03 DEFINITIONS

A. SPD: Surge protection device.

### 1.04 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 power distribution units.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings:

1. Include plans, elevations, sections, and mounting details.

C.

1. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

2. Include diagrams for power, signal, and control wiring.

## 1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Seismic Qualification Certificates: For power distribution units, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Product Certificates: For each type of power distribution unit, signed by product manufacturer.

D. Source quality-control reports.

1. For each factory test of power distribution units.

E. Field quality-control reports.

## 1.06 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For power distribution units to include in emergency, operation, and maintenance manuals.

## 1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer. Maintain a service center capable of providing training, parts, and emergency on-site repairs in less than eight hours' maximum response time.

B. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver equipment in fully enclosed vehicles after specified environmental conditions have been permanently established in spaces where equipment is to be placed.

B. Store equipment in spaces with environments controlled within manufacturer's ambient temperature and humidity tolerances for non-operating equipment.

1.09 FIELD CONDITIONS

A. Environmental Conditions: Units shall be capable of operating continuously in the following environmental conditions without mechanical or electrical damage or degradation of operating capability.

1. Storage Temperature Range: Minus 67 to plus 185 deg F (Minus 55 to plus 85 deg C).
2. Operating Temperature Range: 32 to 104 deg F (0 to 40 deg C).
3. Relative Humidity Range: 0 to 95 percent, noncondensing.
4. Altitude: Sea level to 1000 feet above sea level.

**PART 2 - PRODUCTS**

2.01 MANUFACTURERS

A. Eaton marina power equipment or equal

B. Source Limitations: Obtain power distribution unit and associated components specified in this Section from a single manufacturer with responsibility for entire power distribution unit installation.

2.02 MANUFACTURED UNITS

A. Description: Integrated and coordinated assembly of power-line-conditioning and distribution components packaged in a single cabinet or modular assembly of cabinets each with full-swivel casters mounted to bottom frame. Include the following components:

1. Input-power, circuit-breaker section.
2. Step down 480v – 208/120v 3 phase transformer.
3. Cooling fan system.
4. Output panelboard.
5. Surge Protection Device system.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NFPA 70.

D. Wiring Access: Bottom wiring access.

E. Unit Capacity Rating: Carry indicated rms kilovolt-ampere load continuously without affecting the normal operation of the circuit breakers, monitoring system, or unit controls and without exceeding rated insulation temperature for the following input voltage and load current:

1. Input Voltage: Within rated input-voltage tolerance band of unit.
2. Load Current: Minimum of 3.0 crest factor and 85 percent total harmonic distortion.

## 2.03 INPUT-POWER, CIRCUIT-BREAKER SECTION

A. Description: Three-pole, thermal-magnetic-type circuit breaker, rated for indicated interrupting capacity and 125 percent of input current of unit at 100 percent rated load at unit capacity rating.

## 2.04 TRANSFORMER SECTION

A. Description: Dry-type, electrostatically shielded, three-phase, common-core, convection-air-cooled isolation transformer.

1. Comply with UL 1561 including requirements for nonsinusoidal load-current-handling capability defined by designated K-factor.
2. Cores: Electrical grade, non-aging silicon steel with high permeability and low hysteresis losses, one leg per phase.
3. Coil Material and Insulation: Copper windings, 220 deg C insulation class.
4. Temperature Rise: Designed for 150 deg C rise above 40 deg C ambient.
5. Output Impedance: 3.5 plus or minus 0.5 percent.
6. Regulation: 2 to 4 percent maximum, at full-resistive load; 5 percent maximum, at rated nonlinear load.
7. Full-Load Efficiency: Minimum 96 percent at rated nonlinear load.
8. Magnetic-Field Strength External to Transformer Enclosure: Less than 0.1 gauss at 450 mm.
9. K-Factor Rating: Transformers indicated to be K-factor rated shall comply with UL 1561 requirements for nonsinusoidal load current-handling capability to the degree defined by designated K-factor.

a. Unit shall not overheat when carrying full-load current with harmonic distortion corresponding to designated K-factor.
b. Indicate value of K-factor on transformer nameplate.
c. Unit shall meet requirements of NEMA TP 1 when tested according to NEMA TP 2 with a K-factor equal to one.

10. Electrostatic Shielding: Independently shield each winding with a full-width, single, copper, electrostatic shield arranged to minimize interwinding capacitance.

a. Coil leads and terminal trips shall be arranged to minimize capacitive coupling between input and output connections.
b. Shield Terminal: Separate, and marked "Shield" for grounding connection. Shield shall be connected to the reference ground point for the distribution panels.
c. Capacitance: Limit capacitance between primary and secondary windings to a maximum of 33 picofarads over a frequency range of 20 Hz to 1 MHz.
d. Common-Mode Noise Attenuation: 120 dB minimum, 0.5 to 1.5 kHz; minus 65 dB minimum, 1.5 to 100 kHz.
e. Normal-Mode Noise Attenuation: 52 dB minimum, 1.5 to 10 kHz.

11. Neutral Rating: 1.732 times the system full-load ampere rating.
12. Shipping Restraints: Paint or otherwise color code bolts, wedges, blocks, and other restraints that are to be removed after installation and before energizing. Use fluorescent colors that are easily identifiable inside the transformer enclosure.

## 2.05 SPD SYSTEM

A. Description: Integrated SPD system, complying with Surge Protection for Low-Voltage Electrical Power Circuits, to protect unit panelboard, and having the following features:

1. Disconnect Device: Manual, three-pole, fused disconnect switch to de-energize SPD system while permitting power distribution units to continue operation. Fuses are rated at 200-kA interrupting capacity.
2. Nonlinear Loading: System shall accommodate rated-load current with a minimum 3.0 crest factor and 85 percent total harmonic distortion.

## 2.06 OUTPUT PANELBOARDS

A. Description: Panelboards complying with Section 262416 "Panelboards" except for mounting provisions. Mount single panelboards on power distribution unit behind flush doors. Include the following features:

1. Construction: 30 pole, 208 V, three phase; capable of accepting branch circuit breakers rated to 100 A.
2. Panelboard Rating: 300A, 400A, with main circuit breaker.
3. Panelboard Phase, Neutral, and Ground Buses: Copper, with neutral bus at least 1.732 times the nominal phase bus rating.
4. Isolated Ground Bus: Copper, adequate for branch-circuit equipment ground conductors; insulated from supports.
5. Branch Circuit Breakers: Bolt on.
6. Cable Racks: Removable and arranged for supporting and routing cables for panelboard entrance.
7. Access Panels: Arranged so additional branch-circuit wiring can be installed and connected in the future.

## 2.07 SOUND LEVEL

A. General: Fully assembled products comply with minimum sound-level requirements in NEMA ST 20 for transformers of corresponding ratings when factory tested according to IEEE C57.12.91.

B. General: Fully assembled products have a minimum of 3 dB less than the maximum sound levels prescribed for transformers of corresponding ratings when factory tested according to IEEE C57.12.91.

1. Low-Sound-Level Requirements: Maximum sound levels when factory tested according to IEEE C57.12.91, as follows:
   a. 51 to 150 kVA: 45 dBA.
   b. 151 to 300 kVA: 50 dBA.

C. Mount transformer on rubber isolation pads.

## 2.08 ENCLOSURE REQUIREMENTS

A. A single, freestanding, stainless steel, NEMA Type 3R enclosure. Opening of an exterior door shall not provide access to any live parts. Panels and covers that expose hazardous voltages shall require tools to remove.

B. Access from front, top, and side only for all installation, operations, and normal maintenance, including infrared scanning of bus and breakers. All normal

operating controls and instrumentation shall be located on the front of the enclosure.

C. Arrange enclosure to allow lifting and moving via forklift.

2.09 FINISHES

A. Manufacturer's standard finish over corrosion-resistant pretreatment and primer.

2.10 SOURCE QUALITY CONTROL

A. Factory Tests: Design and routine tests shall comply with referenced standards.

B. Factory Sound-Level Tests: Conduct sound-level tests on equipment. Comply with IEEE C57.12.91 and NEMA ST 20.

## PART 3 - EXECUTION

3.01 INSTALLATION

A. Arrange power distribution units to provide adequate access to equipment and circulation of cooling air. Locate transformers away from corners and not parallel to adjacent wall surface.

B. Coordinate size and location of concrete bases with actual power distribution unit provided.

C. Equipment Mounting:

1. Install power distribution units on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and existing foundations.
2. Comply with requirements for vibration isolation and seismic control devices specified in Section 260548.16 "Seismic Controls for Electrical Systems."
3. Supports shall penetrate and be independent of the access flooring.

D. Identify equipment and install warning signs according to Section 260553 "Identification for Electrical Systems."

E. Coordinate layout and installation of power distribution units with Owner's equipment.

1. Meet jointly with electronic equipment representatives and Owner's representatives to exchange information and agree on details of equipment arrangements and installation interfaces.
2. Record agreements reached in meetings and distribute record to other participants.
3. Adjust arrangements and locations of power distribution units to accommodate and optimize arrangement and space requirements of equipment.

## 3.02 CONNECTIONS

A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

1. Separately Derived Systems: Make grounding connections to grounding electrodes as indicated; comply with NFPA 70.

B. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

D. Install flexible connections at conduit and conductor terminations and supports to eliminate sound and vibration transmission to the building structure.

## 3.03 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification for circuit breakers, molded case; and for transformers, dry type, air cooled, low voltage. Certify compliance with test parameters.
2. Perform functional tests of power distribution units throughout their operating ranges. Test each monitoring, status, and alarm function.

D. Remove malfunctioning units, replace with new units, and retest as specified above.

E. Infrared Scanning: Two months after Substantial Completion, perform an infrared scan of conductor and bus connections.

1. Use an infrared-scanning device designed to measure temperature or to detect significant deviations from normal values. Provide documentation of device calibration.
2. Perform two follow-up infrared scans of main breaker, transformer, and panelboards, one at 4 months and the other at 11 months after Substantial Completion.
3. Prepare a certified report identifying connections checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and scanning observations after remedial action.

F. Test Labeling: On completion of satisfactory testing of each unit, attach a dated and signed "Satisfactory Test" label to tested component.

G. Power distribution unit will be considered defective if it does not pass tests and inspections.

H. Prepare test and inspection reports.

## 3.04 STARTUP SERVICE

A. Perform startup service.

1. Verify that power distribution units are installed and connected according to the Contract Documents.
2. Verify that electrical wiring installation complies with manufacturer's submittal and with written installation requirements in other electrical Sections.
3. Complete installation and startup checks according to manufacturer's written instructions.

## 3.05 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

B. Adjust power distribution units to provide optimal voltage to equipment served throughout normal operating cycle of loads served. Record input and output voltages and adjustment settings, and incorporate into test results.

3.06 CLEANING

A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

3.07 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain power distribution units.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for power center substations shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 26 27 26

# WIRING DEVICES

## PART 1 - GENERAL

1.01 SCOPE

A. This section includes specifications for the lighthouse power pedestal and the installation and field quality control of locking receptacles.

1.02 SUMMARY

A. Section Includes:
1. Twist-lock receptacles.
2. Prefabricated lighthouse power pedestal.

1.03 ACTION SUBMITTALS

A. Product Data:
1. Receptacles with ground fault device.

1.04 WARRANTY FOR DEVICES

A. Special Manufacturer Extended Warranty: Manufacturer warrants that devices perform in accordance with specified requirements and agrees to provide repair or replacement of devices that fail to perform as specified within extended warranty period.

## PART 2 - PRODUCTS

2.01 LOCKING RECEPTACLES

A. NEMA L5-30, 125 V, 30A; Isolated Ground Locking:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Arrow Hart, Wiring Devices; Eaton, Electrical Sector.
b. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
c. Leviton Manufacturing Co., Inc.

2. Regulatory Requirements:

    a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

3. General Characteristics:

    a. Reference Standards: UL CCN RTRT and UL 498.

B. NEMA L6-50, 280 V, 50A; Isolated Ground Locking Receptacle:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Arrow Hart, Wiring Devices; Eaton, Electrical Sector.
    b. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
    c. Leviton Manufacturing Co., Inc.

2. Regulatory Requirements:

    a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

3. General Characteristics:

    a. Reference Standards: UL CCN RTRT and UL 498.

4. Options:
    a. Configuration:

        1) 2 pole, 3 wire, grounding NEMA L6-50R.

C. Lighthouse Power Pedestal:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Eaton, Electrical Sector.

2. Regulatory Requirements:

    a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

3. General Characteristics:

a. Durable construction: to withstand outdoor conditions and heavy sunlight.

b. Double-sided receptacles access.

c. Cable TV, phone, internet and water connections.

d. Digital metering & remote monitoring.

e. Ground fault notification.

## PART 3 - EXECUTION

### 3.01 INSTALLATION OF LOCKING RECEPTACLES

A. Comply with manufacturer's instructions.

B. Reference Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
3. Receptacle Orientation: Unless otherwise indicated in Contract Documents, orient receptacle to match configuration diagram in NEMA WD 6.
4. Consult Architect for resolution of conflicting requirements.

C. Identification:

1. Identify cover or cover plate for device with panelboard identification and circuit number in accordance with Section 260553 "Identification for Electrical Systems."

a. Mark cover or cover plate using hot, stamped, or engraved machine printing with white filled lettering, and provide durable wire markers or tags inside device box or outlet box.

### 3.02 FIELD QUALITY CONTROL OF LOCKING RECEPTACLES

A. Field tests and inspections must be witnessed by city of Berkeley

B. Tests and Inspections:

1. Insert and remove test plug to verify that device is securely mounted.
2. Verify polarity of hot and neutral pins.

3. Measure line voltage.
4. Measure percent voltage drop.
5. Measure grounding circuit continuity; impedance must be not greater than 2 ohms.
6. Perform additional installation and maintenance inspections and diagnostic tests in accordance with NECA NEIS 130 and manufacturers' instructions.

C. Nonconforming Work:

1. Device will be considered defective if it does not pass tests and inspections.
2. Remove and replace defective units and retest.

D. Manufacturer Services:

1. Engage factory-authorized service representative to support field tests and inspections.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for wiring devices shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 31 10 00

# SITE CLEARING

## 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. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Stripping and stockpiling rock.
6. Removing above- and below-grade site improvements.
7. Disconnecting, capping or sealing, and removing site utilities or abandoning site utilities in place.
8. Temporary erosion and sedimentation control.

### 1.03 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.

D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.04 MATERIAL OWNERSHIP

A. Except for materials indicated to be stockpiled or otherwise remain City's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.05 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or video recordings.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.06 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from City and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed trafficways if required by City or authorities having jurisdiction.

B. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protectionmeasures are in place.

C. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

**PART 2 - PRODUCTS**

2.01 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 23 00.20 "Excavation and Fill."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #23 (surface-tolerant, anticorrosive metal primer) or SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.

## PART 3 - EXECUTION

### 3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to City.

### 3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

### 3.03 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site according to requirements in Division 1 "General Requirements."

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations according to requirements in Division 1 "General Requirements."

## 3.04 EXISTING UTILITIES

A. City will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
1. City will arrange to shut off indicated utilities when requested by Contractor.

C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by City or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify City not less than three days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without City's written permission.

E. Excavate for and remove underground utilities indicated to be removed.

F. Removal of underground utilities is included in earthwork sections; in applicable fire suppression, and plumbing, electrical, communications, and utilities sections; and in Demolition section.

## 3.05 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove roots larger than 3 inches in diameter, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Use only hand methods or air spade for grubbing within protection zones.
4. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

## 3.06 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth of 6 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.

## 3.07 STOCKPILING ROCK

A. Remove from construction area naturally formed rocks that measure more than 1 foot across in least dimension. Do not include excavated or crushed rock.

B. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.

1. Limit height of rock stockpiles to 36 inches.
2. Do not stockpile rock within protection zones.
3. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.

## 3.08 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.09 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off City's property.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for Site Clearing shall be considered as included in the various other bid items requiring site clearing, protecting existing vegetation to remain, removing existing vegetation, clearing and grubbing, removing, stockpiling and offhauling waste materials, etc., and no separate payment will be made thereof.

END OF SECTION

# SECTION 31 23 00.20

# EXCAVATION AND FILL

## PART 1 - GENERAL

1.01 SCOPE

A. Perform all structural excavation, trenching, and backfilling work as shown in the specified including but not limited to, utility trenches, footings, and foundations, and for the Berkeley Marina Dock Replacement (D&E) Project.

1.02 STANDARDS

A. All work shall conform to these Specifications, as well as all applicable codes of governmental agencies having jurisdiction over the work.

1.03 SUBMITTALS

A. Product Data

1. Aggregate base

B. Test Reports

1. Fill and backfill test

2. Select material test

3. Density tests

4. Copies of all laboratory and field test reports within 24 hours of the completion of the test.

## PART 2 - PRODUCTS

2.01 MATERIALS

A. General Backfill: Backfill material shall be approved by the City's Representative prior to its use. Excavated material and excess material from site grading may be re-used for backfilling and grading, provided such fill shall be homogeneous, free from rocks, rubbish, organic material, etc., and shall consist of fragments capable of being thoroughly crushed and consolidated into a dense, uniform compact fill,

and shall meet the following requirements:

| Sieve Size | Percentage Passing |
|---|---|
| 6 inch | 100 |
| 3 inch | 95-100 |
| No. 200 | 10-75 |
| Plasticity index | 15 maximum |

B. Structural Backfill/Base Material

Aggregate base shall be Caltrans Class 2 Aggregate base. Aggregate base shall consist of crushed stone or slag, gravel, shell, sand, or other sound, durable, approved materials processed and blended or naturally combined. Aggregates shall be durable and sound, free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign material. Material retained on the No. 4 sieve shall have a percentage of wear not to exceed 50 percent after 500 revolutions when tested as specified in ASTM C 131. At least 50 percent by weight retained on each sieve shall have one freshly fractured face with the area at least equal to 75 percent of the smallest midsectional area of the piece. Aggregate shall be reasonably uniform in density and quality. Aggregates shall have a maximum size of 1 1/2 inches and shall be within the limits specified as follows:

Maximum Allowable Percentage by Weight
Passing Square-Mesh Sieve

| Sieve Designation | Rigid Pavement Base Course |
|---|---|
| 2" | 100 |
| 1 1/2" | 90-100 |
| 3/4" | 50-85 |
| No. 4 | 25-85 |
| No.30 | 10-25 |
| No. 200 | 2-9 |

## PART 3 - EXECUTION

### 3.01 EXCAVATING AND BACKFILLING FOR TRENCHES

A. Perform all necessary excavation, shoring, pumping and dewatering and

backfilling required for the proper laying of all underground pipes and conduits.

B. All piping in ground shall have a minimum cover of 2'-0", except as otherwise shown, and shall be laid in ditches dug true to grade and line, avoiding sharp breaks. Piping shall bear equally over its entire length at bottom of ditch. Rock or unstable material encountered at grade shall be replaced with sand fill to a depth of 6 inches below pipe.

C. Backfill: Fill trenches with excavated material in 6 inch to 8 inch uncompacted thick layer, compacted to 90% relative density. Backfill should be moisture-conditioned to near-optimum in accordance with ASTM D 1557.

D. Backfilling shall be commenced as soon as practical after subsurface work is installed and reviewed by the Landscape Architect.

E. No wood or debris shall be buried in any fill. The fill material shall be non-expansive.

F. Provide shoring, excavation pumping and other requirements as necessary at excavations for points of connection.

## 3.02 STRUCTURAL EXCAVATION

A. Structural Excavation: Make all excavation to the grades and elevations shown on the drawings, or to the subgrades required to obtain the finished grades shown thereon. Accurately cut footing trenches. Where footings are to be cut "neat", the trench or excavation width shall be increased by 2 inches from the dimensions shown on the drawings, so as to permit pouring footings against earth banks. If soil type or weather does not permit such excavations, excavate wide enough to permit full forming of footings. If any excavation is made below proper grade, the City shall be immediately notified, and the grade shall be restored in whatever manner, at no expense to the City. All excavations shall be kept free of standing water until concrete work, paving or backfilling is complete. Shore and brace excavations when required to prevent cave-ins.

B. Foundations from previous structures, underground utilities or other buried structures shall be removed in their entirety and replaced with compacted engineered fill.

C. When zones of soft or saturated soils are encountered at the overexcavated levels during excavation and compaction, deeper excavation shall be required to expose firm soil. This shall be determined in the field by the Geotechnical Engineer.

## 3.03 STRUCTURAL BACKFILL/BASE

A. A minimum of 8 inches of Caltrans Class 2 aggregate base (AB) should be placed and compacted to at least 90% relative compaction for all new reinforced concrete

slabs and footings.

B. Place in 6 inch lifts. Do not place over wet or frozen areas. Place backfill material adjacent to structures as the structural elements are completed and accepted and as indicated on the drawings for placement against the retaining wall. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against the structure.

3.04 SURPLUS MATERIAL

A. Any excavated material which proves to be unsuitable or which is not required for backfilling shall be removed from the immediate work area and disposed of off-site.

3.05 CLEANUP

A. Upon completion of the work under this Section, remove immediately all surplus materials, rubbish and equipment associated with or used in the performance of this work. Failure to perform such cleanup operations within 48 hours shall be considered adequate grounds for having the work done by others at the Contractor's expense.

## PART 4 - MEASUREMENT AND PAYMENT

**F**ull compensation for Excavation and Backfill shall be considered as included in the various bid items requiring structural excavation, trenching, and backfilling work, and no separate payments will be made thereof.

END OF SECTION

# SECTION 31 23 19

# DEWATERING

## PART 1 GENERAL

### 1.01 SUMMARY

A. Section Includes:
   1. Dewatering, depressurization, draining and maintaining trenches, excavations and foundation beds in a stable condition.

### 1.02 SUBMITTALS

A. Submittals shall be in accordance with Section 01 32 30, Progress Schedules and Submittals

B. Administrative Submittals:
   1. Discharge permits.

## PART 2 PRODUCTS

Not Used

## PART 3 EXECUTION

### 3.01 GENERAL

A. Continuously control water during course of construction, including weekends and holidays and during periods of work stoppages, and provide adequate backup systems to maintain control of water.

### 3.02 SURFACE WATER CONTROL

A. Remove surface runoff controls when no longer needed.

### 3.03 DEWATERING SYSTEMS

A. Provide, operate, and maintain dewatering systems of sufficient size and capacity to permit excavation and subsequent construction in dry and to lower and maintain groundwater level below the lowest point of excavation. Continuously maintain excavations free of water, regardless of source, and until backfilled to final grade.

B. Provide sufficient redundancy in each system to keep excavation free of water in event of component failure.

C. Provide supplemental ditches and sumps only as necessary to collect water from local seeps. Do not use ditches and sumps as primary means of dewatering.

3.04 DISPOSAL OF WATER

A. Obtain discharge permit for water disposal from authorities having jurisdiction.

B. Treat water collected by dewatering operations, as required by regulatory agencies, prior to discharge.

C. Discharge water as required by discharge permit and in manner that will not cause erosion or flooding, or otherwise damage existing facilities, completed Work, or adjacent property.

D. Remove solids from treatment facilities and perform other maintenance of treatment facilities as necessary to maintain their efficiency.

3.05 PROTECTION OF PROPERTY

A. Make assessment of potential for dewatering induced settlement. Provide and operate devices or systems necessary to prevent damage to existing facilities, completed Work, and adjacent property.

B. Securely support existing facilities, completed Work, and adjacent property vulnerable to settlement due to dewatering operations. Support shall include, but not be limited to, bracing, underpinning, or compaction grouting.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for DEWATERING shall be considered as included in the various bid items requiring dewatering, depressurization, draining and maintaining trenches, excavations and foundation beds in a stable condition, and no separate payments will be made thereof.

END OF SECTION

# SECTION 31 62 13.20

# PRESTRESSED CONCRETE GUIDE PILES

## PART 1 - GENERAL

### 1.01 SCOPE

This section includes specifications for fabrication, installation and inspection of all concrete prestressed piles used for the floating dock guide piles, including cone hat at the top of piles, as indicated on the Project Drawings and specified herein. These piles will resist loads from the docks and moored vessels as noted in Section 35 51 13.20, Concrete Floating Dock System.

### 1.02 PERMIT AND CONDITIONS

The Contractor shall conform to the project permits for the installation of all piles. The number of piles depicted on plans are minimum requirements.

### 1.03 GEOTECHNICAL DATA

All geotechnical design data is based on the geotechnical investigation report by Treadwell & Rollo, "Geotechnical Investigation, Berkeley Marina Rehabilitation December 16, 2004, available upon request.

Berkeley Marina Dock D & E Replacement Project, Pile Driving & Height Geotechnical Memo, Dated April 25, 2022.

### 1.04 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN CONCRETE INSTITUTE (ACI):

ACI 211.1 (1991) Selecting Proportions for Normal, Heavyweight and Mass Concrete Reapproved 2009

ACI 214 (1977, R 2011) Evaluation of Strength Test Results of Concrete

ACI 315 (2017) Details and Detailing of Concrete Reinforcement

ACI 318 (2019) Building Code Requirements for Reinforced Concrete

ACI 543R-12 Recommendations for Design, Manufacture and Installation of Concrete Piles

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

ASTM A 416 (2018) Standard Specification for Low-Relaxation, Seven -Wire Steel Strand for Prestressed Concrete

ASTM A 706/ A 706M (2016) Standard Specification for Deformed and Low Alloy Steel Bars for Concrete Reinforcement

ASTM A 615/A 615M (2020) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

ASTM A 1064/A1064M (2018) Standard Specification for Carbon Steel Wire and Welded Wire Reinforcement, Plain and Deformed for Concrete.

ASTM C 31 (2021) Making and Curing Concrete Test Specimens in the Field

ASTM C 33 (2018) Standard Specification for Concrete Aggregates

ASTM C 39 (2021) Standard Specification Compressive Strength of Cylindrical Concrete Specimens

ASTM C 136 (2020) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

ASTM C 143 (2020) Standard Test Method for Slump of Hydraulic Cement Concrete

ASTM C 150 (2021) Standard Specification for Portland Cement

ASTM C 172 (2017) Standard Practice for Sampling Freshly Mixed Concrete

ASTM C 260 (2016) Standard Practice for Air Entraining Admixtures for Concrete

ASTM C 494 (2020) Standard Practice for Chemical Admixtures for Concrete

ASTM C 618 (1994) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

AMERICAN WELDING SOCIETY (AWS):

AWS D1.4 (2018) Structural Welding Code Reinforcing Steel

PRECAST/PRESTRESSED CONCRETE INSTITUTE (PCI):

1. PCI JR-382 Design, Manufacture and Installation of Prestressed Concrete Piling

2. PCI MNL-116 (2021) Manual for Quality Control for Plants and Production of Structural Precast Concrete Products

3. PCI Design Handbook Eighth Edition with all Interims and Errata

## 1.05 SUBMITTALS

A. Contractor shall submit the following:

1. Pile Shop Drawings: Prepare shop drawings in accordance with ACI 315. Indicate placement of reinforcement including tendons. Indicate location of embedded or attached lifting devices, employment of pick-up points, support points other than pick-up points, and any other methods of pick-up. Shop drawings shall bear the seal of a professional engineer with a current registration in the State of California attesting that the piles conform to all design requirements.

2. Pile cap data sheet

B. Pile Installation Plan:

1. Show locations of all the dock system guide piles and identify each pile with a unique identification number. Piles on plan may be relocated based on the Contractors and Float fabricator's recommendation. Note the minimum number of piles are depicted on plans.

2. Provide a plan indicating where the numbered piles are to be installed including a sequence or phasing plan with estimated drive dates for each location. Use the identification number on all pile records. Indicate the driving sequence and record the date of driving as work progresses. This plan will be a record document. Contractor to determine final pile location

based on industry standard practice.

3. Provide installation procedures for the pile driving plan. The installation instruction shall contain a schedule of pile installation and proposed barge or crane locations to drive the piles. Indicate how the required tolerances will be met.

4. Provide make and model of pile-driving equipment proposed for the work and capacity of each type of equipment proposed for use in the work. Show details of driving helmets, cap-blocks, and pile cushions. Submit procedure for pile cut-off, pile repair, and finishing.

5. Submit the initial pile installation plan at least 3 weeks prior to the start of pile driving and an updated record plan.

C. Concrete Mix Design Data:

Submit a concrete mix design. Submit at least 3 weeks before concrete is placed. Include the following:

1. Strength
2. Slump.
3. Unit weight of concrete.
4. Quantities of all ingredients.
5. Type of Portland cement.
6. Quantity of air entrained.
7. Source of fine and coarse aggregate.
8. Previous tests or past service.
9. Sieve analysis for aggregates, including fineness modulus.
10. Admixtures
11. Name and address of proposed concrete supplier

D. Quality Control Procedures.

Submit precasting manufacturer's quality control procedures and qualifications of quality control personnel in accordance with PCI MNL-116.

E. Factory Test Reports:

Prior to pile fabrication, submit certified test reports for the following tests specified in ASTM C 33 for all aggregates:

1. Gradation (sieve analysis).
2. Amount of Material Finer than No. 200 Sieve.

3. Organic Impurities.
4. Soundness.
5. Clay Lumps and Friable Particles.
6. Coal and Lignite.
7. Weight of Slag.
8. Fineness Modulus.
9. Reactive Aggregates.

F. Field Test Reports: Submit concrete cylinder compressive strength test results.

G. Certificates:

1. Prestressing Steel. Certification from suppliers attesting to the ultimate strength of the strands.

2. Reinforcing Steel. Certification from suppliers shall attest to the yield strength of the reinforcing steel.

3. Concrete Mix Design. Certify, using an Engineer approved independent commercial testing laboratory, that proportioning of mix is in accordance with ACI 211.1 or ACI 318 for specified strength and is based on aggregate data which has been determined by laboratory tests during last twelve months.

4. Corrosion Inhibiting Additive. Certification from manufacturer attesting that the proposed product has been in use for five years in waterfront concrete construction without harmful reactivity with cement, aggregate or reinforcing.

H. Records:

1. Submit pile driving records no more than 5 business days after installation of piles.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Cement: ASTM C 150, Type II, low alkali, with tricalcium aluminate (C3A) content less than 8 percent.

B. Water: Use potable water.

C. Aggregates: ASTM C 33, except as modified herein. Provide aggregate free from any substance which may be deleteriously reactive with alkalis in cement in an

amount sufficient to cause excessive expansion of concrete.

D. Admixtures:

1. All concrete shall use an air entraining admixture that conforms to the requirements in ASTM C 260 to obtain air entrainment of 5 percent, plus or minus 1 percent.

2. All concrete shall contain a calcium nitrite corrosion inhibiting solution that conforms to the requirements in ASTM C 494, Type C, as follows:

   a. The calcium nitrite admixture shall be as manufactured by W.R. Grace, "DCI", or approved equal.

   b. The calcium nitrite admixture shall be added to the concrete at the rate of 2.5 gallons per cubic yard.

   c. The water in the corrosion inhibiting solution shall be considered as part of the mixing water.

3. Do not use admixtures containing chlorides.

4. Fly Ash shall conform to ASTM C 618, Class F.

5. Use High-Range Water Reducing Agent, ASTM C 494, Type C or Type F as manufactured by W.R. Grace, or approved equal.

E. Prestressing Steel: Use seven-wire low relaxation strand conforming to ASTM A 416, Grade 270. Use prestressing steel free of grease, oil, wax, paint, soil, dirt, and loose rust. Do not use prestressing strands or wire having kinks, bends, or other defects.

F. Reinforcing Steel: All reinforcing steel including dowels shall conform to ASTM A 615/A 615M, Grade 60, deformed bars.

G. Ties and Spirals: Steel, ASTM A 82 for spirals and ASTM A 615/A 615M for ties.

## 2.02 CONCRETE MIX DESIGN

A. ACI 211.1 or ACI 318. The concrete to be used for the piles shall have a minimum compressive strength of 6,500 psi at 28 days and a maximum size aggregate of 3/4 inch. The water cement ratio shall not exceed 0.35.

## 2.03 FABRICATION OF PILES

A. Formwork:

1. Provide forms of metal, braced and stiffened against deformation, accurately constructed, watertight, and supported on unyielding casting beds. Forms shall produce a smooth, dense surface. Chamfer edges and ends ¾ inch, unless otherwise indicated.

2. Forms shall permit movement of pile without damage during release of prestressing force. Make piles to dimensional tolerances in accordance with PCI MNL-116.

B. Pretensioning: Measure tension to which steel is to be pretensioned by jack pressure read on a calibrated gage and verify by elongation of steel. Use gage calibrated within last 6 months by a laboratory approved by CALTRANS. Provide means for measuring elongation of steel to nearest 1/8 inch. When difference between results of measurement and gage reading is more than 5 percent, determine cause of discrepancy and correct. Give tensioning steel a uniform prestress prior to being brought to design prestress. Induce same initial prestress in each unit when several units of prestressing steel in a pile are stretched simultaneously.

C. Casting:

1. Conveying. Clean conveying equipment thoroughly before each run. Convey concrete from mixer to forms as rapidly as practicable by methods which will not cause segregation or loss of ingredients. Deposit concrete as nearly as practicable to its final position. During placing, make any free vertical drop of the concrete less than 3 feet. Remove concrete which has segregated in conveying or placing.

2. Placing and Finishing. Perform concrete casting within 3 days after pretensioning steel; however, do not deposit concrete in forms until placement of reinforcement and anchorages has been inspected and approved by pile manufacturer's quality control representative. Produce each pile of dense concrete with reinforcement retained in its proper position during fabrication. Use vibrator with heads smaller than the minimum distance between steel for pretensioning. Finish exposed top surface of square pile to obtain a face that is as smooth and true to line as the formed surfaces of the pile. Make surface of pile ends perpendicular to axis of pile.

D. Curing of Piles:

1. Moist Curing. Moist cure using moist burlap coverings, plastic sheeting, or membrane curing compound until minimum strength to detension is achieved.

2. Accelerated Curing. After placement of concrete, moist cure for a period of 4 hours. Accelerated cure until concrete has reached specified release strength. Enclose casting bed for accelerated curing with a suitable enclosure. During application of steam or heat, increase the air temperature at a rate not to exceed 60 degrees F per hour. Cure at a maximum temperature of 160 degrees F until concrete has reached specified release strength. Reduce temperature at a rate not to exceed 60 degrees F per hour until a temperature of 20 degrees F above ambient air temperature is reached. After accelerated curing, moist cure using either water or membrane curing until a total accelerated and moist curing time of 72 hours is achieved.

3. Detensioning. Perform releasing of prestressed steel in pretensioned piles in such an order that eccentricity of prestress will be minimized. Gradually release tension in strands from anchorage. Detension after approval by pile manufacturer's quality control representative. Perform transfer of prestressing force when concrete has reached a minimum compressive strength of 4,500 psi.

4. Pile Marking. Mark piling with lines of high visibility, non-permanent paint at one-foot intervals from bottom to top. Number every five feet. Markings shall be clearly visible and legible to the naked eye at a distance of 75 feet. Piles not properly marked will be rejected. Mark pickup points. Maintain a record of pile casting activity which includes concrete test results, casting date, shipping data and other pertinent data to correlate the manufacturing and the driving records.

E. Finishing of Pile Surface: All faces of the octagonal pile shall have a smooth finish. Top 20 feet of pile to have Class 1 finish.

## 2.04 PRODUCT QUALITY CONTROL

A. Concrete piling shall be manufactured in a plant with an established quality control program as attested to by a current certification in the PCI "Certification Program for Quality Control" perform product quality control in accordance with PCI MNL-116.

B. Aggregate Tests:

Take samples of fine and coarse aggregate at concrete batch plant and test. Perform mechanical analysis (one test for each aggregate size) in accordance with ASTM C 136. Tabulate results of tests in accordance with ASTM C 33.

C. Strength Tests:

Sample concrete in accordance with ASTM C 172 at time concrete is deposited for

each production line. Perform slump tests in accordance with ASTM C 143. Mold cylinders in accordance with ASTM C 31. Mold at least six cylinders per day or one for every 20 cubic yards of concrete placed, whichever is greater. Cure cylinders in same manner as piles and for accelerated curing, place at coolest point in casting bed. Perform strength tests in accordance with ASTM C 39. Test two cylinders of each set at 7 days or 14 days, or at a time for establishing transfer of prestressing force (release strength) and removal of pile from forms. Test remaining cylinders of each set 28 days after molding. Contractor shall retain one additional spare cylinder.

D. Changes in Proportions:

If, after evaluation of strength test results, compressive strength is less than specified compressive strength, make adjustments in proportions and water content and changes in temperature, moisture, and curing procedures as necessary to secure specified strength. Submit changes in mix design to the Engineer in writing.

E. Compressive Strength Test Results:

Evaluate compressive strength test results at 28 days in accordance with ACI 214 using a coefficient of variation of 10 percent. Evaluate strength of concrete by averaging test results of each set of standard cylinders tested at 28 days. Not more than 10 percent of individual cylinders tested shall have a compressive strength less than specified compressive strength.

2.05 PILE DRIVING EQUIPMENT

A. The Contractor shall be responsible for selecting a hammer and driving system, which is capable of driving the piles to the design tip elevation without overstressing the piles in either tension or compression.

B. Any special equipment and methods necessary to drive the piling to the required penetration and within specified tolerances shall be provided by the Contractor.

C. The Contractor shall anticipate and allow for the presence of surface and subsurface debris. This allowance shall include provisions for the possibility of removing through excavation, debris that obstructs the installation of piling.

## PART 3 - EXECUTION

3.01 EQUIPMENT

A. Pile Hammers:

Furnish a hammer capable of driving piles to indicated tip elevation considering hammer impact velocity; ram weight; stiffness of hammer and pile cushions; cross section, length, and total weight of pile; and character of subsurface material to be encountered.

B. Driving Helmets and Cushion Blocks:

Hammer Cushion or Capblock: Use a steel driving helmet or cap including a pile cushion between top of pile and driving helmet or cap to prevent impact damage to pile. Use a driving helmet or cap and pile cushion combination capable of protecting pile head, minimizing energy absorption and dissipation, and transmitting hammer energy uniformly over top of pile. Use pile cushion of solid wood or of laminated construction using plywood, softwood or hardwood boards with grain parallel to end of pile. Provide pile cushion with thickness of 6 inches minimum and 12 inches maximum. Replace pile cushion for each new pile, or when it becomes highly compressed, charred or burned, or has become spongy or deteriorated in any manner.

## 3.02 DRIVING PILES

A. Driving Piles:

Drive piles to the indicated elevation. If a pile fails to reach indicated elevation, notify the Engineer and perform corrective measures as directed.
During driving operations, the trowel finished face of each pile shall be turned away from main and marginal walkways for the least visibility to provide the best overall uniform pile appearance.

B. Protection of Piles:

Take care to avoid damage to piles during handling, placing pile in leads, and during pile driving operations. Support piles laterally during driving. Maintain axial alignment of pile hammer with that of the pile. Square pile rotational axis to the axis of the main walkway or the finger float.

C. Tolerances in Driving:

The dock system itself may be used as pile location guide during stabbing and driving.

Piles shall be driven to within 2 inches of the required horizontal and vertical location shown on the plans. Pile shall be driven with a variation of not more than 1.0 percent from vertical and not more than 5º rotation of square. Maintain and check axial alignment and rotational alignment of pile at all times. If subsurface conditions cause pile drifting or rotation beyond allowable alignment tolerance, notify the City Representative and perform corrective measures. The City

Representative may direct the Contractor to remove the pile that is installed beyond the tolerances indicated and require the Contractor to reinstall the pile.

3.03 FIELD QUALITY CONTROL

A. Pile Records:

For each pile, keep a record of the number of blows required for each foot of penetration and number of blows for the last 6 inches penetration. Include in the record the beginning and ending times of each operation during driving of pile, type and size of hammer used, rate of operation, stroke or equivalent stroke for diesel hammer, type of driving helmet, and type and dimension of hammer cushion (capblock) and pile cushion used. Record re-tap data and unusual occurrences during pile driving. Notify the City Representative 2 weeks prior to driving of piles.

Pile driving shall only occur on weekdays between 8:00 a.m. and 5:00 p.m and no pile driving shall occur on weekends or federal holidays. Additionally, pile driving times and procedures shall comply with the conditions of all environmental and work permits. Because project is in a residential area, follow all good-neighbor practices if established during initial project or public meetings.

3.04 BROKEN AND DAMAGED PILES

A. Piles broken or damaged during handling or driving shall, at the discretion of the City Representative, be repaired in an acceptable manner or be replaced.

B. The Contractor shall submit for the City Representative's review his proposed method of repairing piles, which are damaged.

C. Pile repair or replacement shall be at no cost to the City nor cause any delay in the construction schedule.

3.05 TIMING

A. The Contractor shall comply with the allowable pile driving window pursuant to the project permits.

## PART 4 - MEASUREMENT AND PAYMENT

The Contract LUMP SUM price paid for OFFSHORE MARINA AND APPURTENANCES shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved in fabrication, installation and inspection of all concrete prestressed piles used for the floating dock guide piles, including cone hat at the top of piles, complete in place, as shown on the plans, as specified in these Technical Specifications, and as directed by the engineer.

END OF SECTION

# SECTION 32 12 16.16

# ROAD MIX ASPHALT PAVEMENT

## PART 1 - GENERAL

### 1.01 SCOPE

This section includes specifications for fabrication, installation and inspection of all asphalt concrete paving on landside improvements, as indicated on the Project Drawings and specified herein.

A. Section Includes (but is not necessarily limited to):
   1. Plant-mixed asphalt concrete (AC) pavement and other asphaltic concrete items for paving of new road works, where indicated.
   2. Concrete Pavement, where indicated.
   3. Pavement markings and curb painting.

### 1.02 QUALITY ASSURANCE

A. The following reference is hereby made part of this Specification and all work of this Section shall conform to the requirements therein, except as herein modified.
   1. Standard Specifications of the City and Construction Standards in Public Right of Way by City of Berkeley Public Works Engineering Division Dated September 2022 Refer as "Standard Details".
   2. Caltrans Standard Specifications (CTSS or State Standard Specifications, 2022) and Caltrans Standard Plans (CTSP). Delete all references to statistical testing and measurement and payment.
   3. In case of conflict between State Standard Specifications (or CCSF Specifications) and this Specification, this Specification governs.

B. Contractor shall be responsible for materials mix design.

### 1.03 SUBMITTALS

A. Contractor shall submit information to substantiate compliance with this Specification. Minimum information submitted shall include a manufacturer’s certification for asphalt products and an asphalt concrete mix design by an independent, qualified laboratory. Production of asphaltic concrete for this Project shall not begin until the materials and the mix design have been reviewed and accepted by the City's Representative.

B. Contractor shall submit manufacturer's literature describing all paint, thermoplastic material, and markers prior to any paving work.

## PART 2 - PRODUCTS

2.01 ROAD PAVEMENT

A. Aggregates for asphaltic concrete shall conform to the requirements of Section 2001 of the City Standard Department of Public Works Details, maximum 1/2-inch size or Section 89.

B. Asphaltic Materials:

1. Asphalt Cement: Section 92, Asphalt Binders, of State Standard Specifications, with performance grade PG64-10 for use as binder in the asphalt mixture. Amount of asphalt cement shall be based on mix design.
2. Paint Binder: 92 of the State Standard Specifications.
3. Pavement Fabric: Conform to Section 39 of the State Standard Specifications (if any).
4. Aggregate Base: Conform to Section 7597 of the City Standard Specification.
5. Concrete Pavement: Conform to Section 8144 of the City Standard Specification.

2.02 PAVEMENT MARKINGS

A. Pavement markers and traffic lines shall conform to the requirements shown in Drawing STR-6222 of the City Standards. All other pavement delineation not shown on Drawing STR-6222 shall conform to the applicable details shown on CTSP A20 through A24. Where pavement markings are removed, they shall be replaced in kind.

1. Traffic lines and pavement markings shall be thermoplastic material in accordance with CTSS Section 84, "Markings." Traffic lines shall be placed in the locations and color indicated in the Project Drawings.

2. Pavement markers shall be in accordance with State Standard Specification Section 85, “Pavement Markers”.
   a. Adhesive for cementing markers to pavement shall be Rapid Set Epoxy in accordance with State Standard Specification Section 95-1.02E.

B. Thermoplastic material shall conform to either State Specification 8010-21C-21 or 8010-21C-19. The State Specification for thermoplastic material and may be obtained from the Transportation Laboratory, PO Box 19128, Sacramento, CA 95819, telephone, 916-739-2400.

## PART 3 - EXECUTION

## 3.01 PROTECTION

A. Concrete walks, curbs and other improvements adjacent to construction shall be protected. Contractor shall be responsible for damage caused by his employees or equipment and shall make necessary repairs. Buildings and other surfaces shall be covered with paper or other protection, where required.

## 3.02 CONFORM AREAS

A. Where new paving is adjacent to existing pavement, areas shall be treated per the requirements of Section 2001 of the City Standard Specifications.

## 3.03 SURFACE PREPARATION

A. Prior to commencing, all existing pavement shall be prepared in conformance with the requirements of the City Standard Department of Public Works Specifications.

## 3.04 ASPHALT CONCRETE

A. Asphalt concrete base, subbase, leveling course, and wearing surfaces shall be placed and spread in accordance with the requirements of City Standard Specifications Department of Public Works.
B. Where new pavement is to be placed over existing pavement, the existing pavement shall first be planed in conformance to the requirements Under Streets and Sidewalks of the City Standard Department of Public Works Specifications.

## 3.05 CONCRETE PAVEMENT

A. Installation shall conform to Section 7597 to 20A of the City Standard Details.

## 3.06 APPLICATION OF PAVEMENT MARKINGS

A. Markings shall be applied as indicated. Where markings are indicated to connect to existing markings, they shall be applied so as to match existing site pavement markings in both materials and character, except as otherwise revised or modified as shown on the Drawings.
B. Where existing traffic lines and pavement markings are revised by new layout patterns, existing markings shall be removed by grinding.
C. Where existing pavement markings or traffic lines have become damaged or hard to read as a result of the construction, said pavement markings and traffic lines shall be removed and replaced at the contractor’s expense.
D. Surface Preparation: Thoroughly clean surfaces before application of paint.

E. Thermoplastic material for traffic lines shall be applied at a minimum thickness of 0.070-inch. Thermoplastic material for pavement markings and crosswalks shall be applied at a thickness of 0.100 to 0.150-inch.
F. Paint shall be applied pneumatically, where applicable, and at the rate of coverage recommended by the paint manufacturer.
G. Provide guideline sand templates as necessary to control paint application.
H. Edges of marking shall be sharply outlined.
I. Follow paint manufacturer's recommendations regarding drying time required to prevent undue softening of bitumen and to prevent pickup, displacement, or discoloration by tires of traffic.
J. If there is a deficiency in drying of markings, discontinue operation until cause can be determined and corrected.
K. If discoloration of paint occurs owing to bleeding of bituminous materials, apply paint in two coats.
   1. Apply first coat at 35 to 40 percent recommended coverage.
   2. Apply second coat after drying to complete manufacturer's recommended coverage rate.

3.07 CURB PAINTING

A. If existing curbs are not protected from AC staining, curb painting, where indicated, shall be provided by Contractor, at no expense to The City.

3.08 ADJUSTMENT OF MANHOLE FRAMES AND OTHER CASTINGS

A. The Contractor shall comply to Manhole Sewers by the City of Berkeley Department of Public Works, Standard Specifications concerning adjustment of frames and castings.
B. The Contractor shall adjust all manholes and/or castings including, but not limited to, those owned by the Department of Public Works, Department of Electricity (Telecommunication and Information System), Police Department, Fire Department, and of the Auxiliary Water System, and Water Department, and Public Utilities Commission.
C. The Contractor will be assessed $500 for each manhole and/or castings left buried after seven (7) calendar days.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for road mix asphalt pavement shall be considered as included in the contract lump sum price for LANDSIDE MARINA AND APPURTENANCES and no separate payment will be made therefor.

END OF SECTION

SECTION 33 11 16

WATER UTILITY PIPING AND APPURTENANCES

## PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Pipe and fittings for potable water supply piping including domestic water.
2. Valves
3. Underground pipe markers
4. Precast concrete valve and meter boxes
5. Pipe Supports and Anchoring
6. Accessories

B. Related Requirements:
1. Section 02 22 50 – Structure Demolition
2. Section 31 23 00 – Excavation and Fill
3. Section 31 23 19 – Dewatering

1.02 REFERENCE STANDARDS

A. ASTM International:
1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
4. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
5. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

B. American Water Works Association:
1. AWWA C105 - ANSI Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
2. AWWA C110 - ANSI Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm Through 1,219 mm), for Water.
3. AWWA C151 - ANSI Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
4. AWWA C153 - ANSI Standard for Ductile-Iron Compact Fittings for Water Service.

5. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

C. Manufacturer's Standardization Society of the Valve and Fittings Industry:
1. MSS SP-60 - Connecting Flange Joint between Tapping Sleeves and Tapping Valves.

D. National Fire Protection Agency:
1. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances.

1.03 SUBMITTALS

A. Section 01 13 00 – Administrative Requirements and Submittals: Requirements for submittals.

B. Product Data: Submit data on pipe materials, pipe fittings, valves and accessories.

C. Shop Drawings: Submit shop drawings for pipe, fittings, and appurtenances. Indicate piece numbers and locations and restrained joint locations.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

E. Manufacturer's Instructions: Indicate special procedures required to install Products specified.

1.04 CLOSEOUT SUBMITTALS

A. Section 01 17 00 – Execution Requirements and Section 01 17 70 Closeout Procedures: Requirements for submittals.

B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.05 QUALITY ASSURANCE

A. Valves: Mark valve body with manufacturer's name and pressure rating

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

D. Deliver and store valves in shipping containers with labeling in place.

E. Store and protect products in accordance with manufacturers' instructions.

F. Store with seals and labels intact and legible.

G. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

H. For exterior storage of fabricated products, place on sloped supports above ground.

1.07 EXISTING CONDITIONS

A. Verify field measurements prior to fabrication. Indicate field measurements on shop drawings.

## PART 2 PRODUCTS

2.01 GENERAL

A. All solid wall pipe shall be continuously and permanently marked in conformance with the appropriate ASTM.

B. The Contractor shall also require the manufacturer to mark the date of extrusion on the pipe.

C. Refer to Sections 22 11 16 “Domestic Water Piping” and 21 11 00 “Fire-Suppression Water-Service Piping” for piping products.

2.02 UNDERGROUND PIPE MARKERS

A. Manufacturer and Product List or approved equal:
1. Reef Industries, Model Terra “D”.

B. Plastic Ribbon Tape: Bright colored, continuously printed, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service. Tape color and lettering shall be in accordance with the APWA Uniform Color Code for Marking of Underground Utility Location. The identifying lettering shall be a minimum of 1-inch high permanent black lettering.

C. Trace Wire: Electronic detection materials for non-conductive piping products.
1. Unshielded 10 AWG. THWN insulated copper wire. Taped to top pipe at 3 ft intervals for all non-metallic pipe.
2. Conductive tape.

2.03 PRECAST CONCRETE VALVE BOXES AND METER BOXES

A. Conform to City of Berkeley Standards and East Bay Municipal Utility District Standards.

2.04 BEDDING AND COVER MATERIALS

A. Unless otherwise specified or shown, all material used for pipe embedment shall be as specified in Section 31 20 00, “Earthwork”.

2.05 ACCESSORIES

A. Concrete for Thrust Restraints: Conform to Section 03 31 00.

## PART 3 EXECUTION

3.01 EXAMINATION

A. Inspection:
1. Prior to all Work of this section, carefully inspect the installed Work of all other trades and verify that all such Work is complete to the point where this installation may properly commence.
2. Verify that all pipes may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.

B. Discrepancies:
1. In the event of discrepancy, immediately notify the Engineer.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 HANDLING

A. The Contractor shall provide and use proper implements, tools and facilities for the safe and proper handling and protection of the pipe, all as recommended by the manufacturer. Pipe shall be handled in such a manner as to avoid damage to the pipe material or any coating and especially to the ends.

B. When damaged pipe cannot be repaired to the satisfaction of the Owner, it shall be removed from the job.

C. Pipe shall be stored in a safe location, protected from the elements where damage therefrom could result.

D. The pipe shall be carefully lowered in the trench to prevent damage. Under no circumstances shall pipe be dropped or dumped into trenches. Remove foreign matter and dirt from the inside of the pipe and keep it clean during and after laying.

E. The Contractor shall take care to keep from damaging the pipe by heavy loads and unnecessary compactive effort especially for shallow lifts. All damaged pipe shall be replaced. Normally, repairs will not be acceptable.

3.03 INSTALLATION

A. General: Install all pipes in strict accordance with plans and with manufacturers' recommendations as approved by the Engineer.

B. Delivery, storage and handling of ductile-iron pipe and fittings shall follow the recommendations of AWWA and as specified herein.

C. Pressure pipe:
1. Pressure pipe shall be laid in accordance with plans and profiles and typical sections. Before new pipe is placed the subgrade material shall be graded so that pipe will rest firmly on undisturbed granular material for its full length.
2. In general, this should be accomplished by over-excavation, adding stabilization material as required, the inclusion of imported bedding material as shown on the plans. All adjustments to line and grade shall be made by scraping away or filling in the bedding to the body of the pipe and in no case by wedging a blocking. Pipe shall be laid on an unyielding foundation to proper line and grade with uniform bearing under the full length of the pipe with slight hand excavation for the coupling to allow for its thickness.
   a. Where soft or spongy conditions are encountered in the trench at pipe subgrade, this foundation situation shall be corrected by the use of imported stabilization material as specified in Section 31 20 00, “Earthwork”.
   b. All pipe, especially the ends, shall be carefully cleaned before the pipe is joined. Whenever Work ceases for any reason, the end of the pipe shall be closed with a watertight fitting, plug or cover. The interior of the pipe shall be kept free from dirt, foreign material or debris as the Work progresses and the pipe shall be cleaned after completion.
   c. Pressure line shall be laid to the line and grade shown on the plans. In instances where grade shows constant uphill grade to structures or air relief valve, the Contractor shall take all precautions necessary to secure continual smooth alignment to such appurtenances.
3. Joint deflection shall not exceed 50 percent of the manufacturer’s recommended maximum deflection. Fittings shall be provided as required to meet the line and grade indicated on the Contract Drawings.

D. Contractor shall notify Owner in advance per Division 1 requirements of need to shut down any water main and shall notify affected customers at least 7 days in

advance if shutdown is to exceed 2 hours. Owner's staff will perform water main shutoffs.

E. The Contractor is responsible for any and all measures required to remove trapped air from the lines, including making temporary taps as required. Some main segments will need to be installed at greater than the minimum cover to avoid creation of high points or to force the high point to the location of an appurtenance (service tap, etc.)

3.04 PROTECTION, BARRICADES, ETC.

A. Pipe strung out along the trench or stored where it can be damaged or where injury may result to children or the public shall have special precautions taken to prevent damage from occurring. Pipe shall not be spread along trenches for extended periods prior to its actual use. Pipe shall be stored in a safe location out of the traveled way and properly barricaded with suitable lights provided to prevent vehicular damage.

3.05 LAYING BEDDING

A. All buried pipe shall be laid on a prepared bed as hereinbefore specified. After laying, additional bedding material shall be added to a depth of 3 inches or about the mid-point of the pipe depending upon diameter, after which it shall be tamped with a suitable tool to secure uniform full length bedding up to the mid-point of the pipe. Additional bedding material shall then be placed to the depth shown in the standard details of the plans and compacted by mechanical methods to a relative compaction of 90 percent.

B. Take necessary precautions to prevent uplift and floating of the pipe prior to backfilling.

C. Spigot end of the pipe shall be laid in the direction of normal flow away from the booster pumping system.

D. Water in trenches shall be removed by pumping.

3.06 CUTTING PIPE

A. General: Cut pipe for inserting valves, fittings, closure pieces, and as otherwise required, in a neat and workmanlike manner without damaging the pipe or lining and so as to leave a smooth end at right angles to the axis of the pipe.

B. Ductile iron pipe: Cut pipe with milling-type cutter, rolling pipe cutter, abrasive saw cutter, or with sledge and cold cutter. Do not flame cut.

C. Dressing cut ends:
1. Dress cut ends of pipe in accordance with the type of joint to be made.

2. Dress cut ends of mechanical joint pipe to remove sharp edges or projections that may damage the rubber gasket.

3.07 THRUST RESTRAINT

A. Provide fire protection pipe bends with concrete thrust blocks. Pour concrete thrust blocks against undisturbed earth. Locate thrust blocks at each elbow or change of pipe direction to resist resultant force and so pipe and fitting joints will be accessible for repair. Provide minimum sq ft thrust restraint bearing on subsoil per Industry Standards.

B. Install thrust blocks at dead ends of fire water pipe.

3.08 APPURTENANCES

A. General: See plans for location of valves and appurtenances to be installed as a portion of the water line.

B. Tape Wrap: Apply tape wrap per manufacturer's recommendations.

3.09 TOLERANCES

A. Horizontal Line Tolerance: 2 inches.

B. Vertical Grade Tolerance: 1 inch. Any deviation with respect to design line and grade shall be recorded at least once per foot and the records shall be submitted to the Engineer as requested. If the alignment is off line or grade, the necessary corrections shall be made to return to the plan alignment at a rate of not more than 1 inch per 25 feet. All corrective work, including new design, if required, shall be performed by the Contractor at no additional cost to the Owner and is subject to the approval of the Engineer.

3.010 REPAIRS

A. Only new pipe free from defects shall be installed. Portions of broken pipe or short lengths may be used providing they are properly cut back and used as stubs, or short lengths required at structures for flexible joints.

B. Broken or leaking sections of pipe must be replaced. Repair clamps will not be approved.

3.011 PROTECTION OF FINISHED WORK

A. Section 01 17 00 - Execution Requirements: Requirements for protecting finished Work.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

3.012 CLEANING

A. Care shall be taken to keep the pipe clean at all times during the installation. Prior to testing the pipe shall be flushed so that the velocities of 5 feet per second are obtained sufficient to clean the entire length of pipe.

B. If the Contractor digs out any sections subsequent to this where debris could enter the line, the line shall be again flushed through the section that was disturbed.

3.013 TESTING AND FINAL CLEANING

A. Testing and final cleaning of all pipe shall conform to the requirements of Section 33 13 00, "Pressure Piping Systems Testing".

3.014 DISINFECTION OF POTABLE WATER LINES

A. Conform to Section 22 11 16 “Domestic Water Piping”.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for water utility piping and appurtenances shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

**END OF SECTION**

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# SECTION 33 13 00

# PRESSURE PIPING SYSTEMS TESTING

## PART 1 GENERAL

### 1.01 REQUIREMENT

A. The Contractor shall provide all materials, equipment, and labor necessary to perform and complete all pipeline deflection testing, pressure testing, and leakage testing for all pressure piping systems, as specified herein.

B. The Contractor shall be responsible for conveying test water from the source to the point of usage and also for proper disposal, as required, of water used in the testing operations. All costs associated with supply and disposal of test water shall be at the Contractor's expense.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Division 1 General Requirements.

### 1.03 CONTRACTOR SUBMITTALS

A. A testing schedule, including proposed plans for conveyance, control and disposal of test water shall be submitted in writing to the Engineer for review a minimum of 72 hours before testing is to start.

B. The Contractor shall submit laboratory calibration certificates for all gages to the Engineer for review along with the testing schedule.

## PART 2 PRODUCTS

### 2.01 MATERIAL REQUIREMENTS

A. All testing equipment and materials shall be provided by the Contractor. No materials shall be used which would be injurious to pipeline system or structure and future function. All test gages shall be laboratory-calibrated test gages and shall be recalibrated by a certified laboratory at the Contractor's expense prior to the leakage test.

## PART 3 EXECUTION

### 3.01 GENERAL

A. All lines shall be cleaned and flushed prior to leakage testing and video inspection using methods acceptable to the Engineer.

B. Contractor will be solely responsible for the proper disposal of all water used in the

flushing and testing process. Disposal of all water shall be in accordance with appropriate regulatory agency requirements.

C. All flushing and testing operations shall be performed in the presence of the Engineer.

D. All pipe shall be backfilled prior to leakage testing. All tests shall be completed and approved prior to placing of permanent surfacing. When leakage exceeds the amount allowed, the Contractor at its expense, shall locate the leaks and make the necessary repairs or replacements in accordance with the Specifications to reduce the leakage to the specified limits. Any individually detectable leaks shall be repaired, regardless of the results of the tests.

## 3.02 PRESSURE AND LEAKAGE TESTING OF PRESSURE PIPING SYSTEMS

A. General: All pressure piping systems shall be tested for pressure and leakage using a hydrostatic test.

B. Pressure Piping Hydrostatic Test: The Contractor shall furnish all materials, equipment and labor for making a hydrostatic test. Test equipment shall be approved by the Engineer.

1. Furnish the following equipment and materials for the tests:

| AMOUNT | DESCRIPTION |
|---|---|
| 2 | Approved graduated containers |
| 2 | Approved pressure gauges |
| 1 | Hydraulic force pump approved by the Engineer |
| As Required | Suitable hoses and suction pipe |

Gauges for testing shall be calibrated with a standardized test gauge provided by the Engineer at the start of each testing day. The calibration shall be witnessed by the Engineer.

2. Conduct the tests on buried pipe after the trench has been completely backfilled. The Contractor may, if field conditions permit, partially backfill the trench and leave the joints open for inspection and conduct an initial test. The acceptance test shall not, however, be conducted until all backfilling has been completed. Conduct the tests on exposed piping after the piping has been completely installed, including all supports and hangers.

3. Pressure Test: After the pipe has been laid and backfilled and final compaction has been obtained, the Contractor shall test pressure pipe between each valve section or pipe run. The pipe shall be slowly filled with water so that air is removed and the pipe shall be tested hydrostatically to a pressure of 200 psi for a minimum of one hour. Reaction blocking pipe restraints and the like shall be installed prior to test.

All exposed pipe, fittings, valves and joints shall be examined during the test for seepage or other defects. Defects noted by this test shall be removed and replaced by the Contractor with sound material. Afterwards, the test shall be repeated to

the satisfaction of the Engineer.

4. Leakage Test: A leakage test shall be conducted after the pressure test has been satisfactorily completed. The duration of each leakage test shall be two hours and during the test the main shall be subjected to a pressure of 100 psi. Leakage shall not exceed that as shown in Table 6A of AWWA Standard C600-93 or not in excess of 10 gallons per day per inch diameter per mile, whichever is less.
   If any test discloses leakage greater than specified, the Contractor shall at his own expense locate and repair the defective joints until the leakage is within the specified allowance.
5. The separate pressure and leakage tests described above for pressure pipe may be combined into one test by testing the pipe hydrostatically to a pressure of 200 psi for a minimum of two hours while completing all inspections and testing required above for seepage, defects and leakage.
6. Requirements for Exposed Pipelines: All exposed pipelines shall have no visible leakage during the specified test period. Any exposed pipeline with leakage shall be repaired or replaced.

3.03 FINAL CLEANING

A. Prior to final acceptance, all pipelines shall be flushed out and all accumulated construction debris and other foreign matter removed. Cleaning shall be done in a manner that will keep flushed debris from entering equipment and in a manner approved by the Owner.

B. Clean and disinfect domestic water pipelines in accordance with AWWA C651 and in accordance with Section 22 11 19, Domestic Water Piping.

C. Clean fire-suppression water pipelines in accordance with Section 21 11 10, Fire-Suppression Water-Service Piping.

## PART 4 - MEASUREMENT AND PAYMENT

Full compensation for pressure piping systems testing shall be considered as included in the contract lump sum price for MARINA UTILITIES INFRASTRUCTURE and no separate payment will be made therefor.

END OF SECTION

# SECTION 35 31 19.13

# ROCK SLOPE PROTECTION - RIP RAP

## PART 1 GENERAL

### 1.01 SCOPE

This section provides requirements for placing stone for the of existing rip rap at the abutment an abutment walls and all other work not specifically mentioned necessary to repair existing site in the event supplemental rip-rap is required.

### 1.02 REFERENCES

A. Standard Specifications - State of California. Department of Transportation.

1. Section 72 - Slope Protection.

2. Section 96 - Geosynthetics.

B. American Society for Testing and Materials

1. (2009) ASTM C 535 - Standard Test Method for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

### 1.03 SUBMITTALS

A. Contractor shall submit a written plan of the means, methods, equipment and sequences to be employed in the transportation and placement of rock to be used in the work.

B. Contractor shall designate in writing to the City Representative, the source or sources of rock to be used in the work.

C. Contractor shall not commence shipment of any rock without written acceptance of the materials to be used based on the certificates of compliance and plans of means and methods as previously described.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Repair of existing rip rap revetment shall be a graded shore protection system of materials as shown on the Project Drawings.

B. Materials shall be sound, suitable for the intended use, and shall be approved by the City Representative. A sample shall be provided to the City Representative prior to Contractor ordering the material.

C. Rock used in the revetment shall be composed of angular, close-grained, durable and hard quarry rock. Rock shall be free from seams of weaker materials, not subject to weathering or fracture, and of such character as to be suitable for the intended use in permanent construction, and as to resist disintegration from the action of sea water, waves, and weather. Neither breadth nor thickness of individual stones shall be less than one-third its length. Rounded stones or boulders will not be acceptable.

D. Rip Rap (RSP) if required

Only quarried stone, and on-site reclaimed revetment, shall be used. Rock materials shall be well graded and shall conform to CALTRANS "Light Class" Rock Slope Protection and gradation noted in the table below.

| Percent Larger By Weight (SSD) | Limits of Stone Weight (Lbs) |
|---|---|
| 0-5% | 500 |
| 50-100% | 200 |
| 95-100% | 25 |

E. Rock quality shall conform to the following requirements:

| TEST METHOD | METHOD | REQUIREMENTS |
|---|---|---|
| Apparent Specific Gravity | CA 206 | 2.5 Minimum |
| Absorption | CA 206 | 4.2% Maximum |
| Durability Index | CA 229 | 52 Minimum |
| Abrasion Loss | ASTM C 535 | 25% Max./1000 |

F. Woven type rock slope protection fabric shall be Class 8 or 10 per CTSS and conform to the following requirements:

| Specification | Requirement |
|---|---|
| Weight, grams per square meter, min. ASTM Designation: D 3776 | 135 |

| | |
|---|---|
| Grab tensile strength (25-mm grip), kilonewtons, min. in each direction ASTM Designation: D 4632 | 0.45 |
| Elongation at break, percent max. ASTM Designation: D 4632 | 35 |
| Toughness, kilonewtons, min. (Percent elongation x grab tensile strength) | 15 |
| Permittivity, 1/sec., min. ASTM Designation: D 4491 | 0.5 |

## PART 3 EXECUTION

### 3.01 GRADATION

A. Control of gradation shall be by visual inspection. Contractor shall provide separate samples, at the construction site, of each class of revetment material used in the work meeting the specified gradations. These samples shall be used in the work meeting the specified gradations. These samples shall be used as a frequent reference by the City Representative for judging the gradation of revetment materials supplied and placed by the Contractor. Any difference of opinion between the City Representative and the Contractor shall be resolved by dumping and physically checking the gradation of random loads of revetment materials as selected by the City Representative. Mechanical equipment, a sorting site, and labor needed to assist in checking gradation shall be provided by the Contractor at no cost to the City. Samples of revetment materials may be used in completing the revetment.

### 3.02 RIP-RAP PLACEMENT

A. Contractor shall develop means and methods of rip-rap placement at the project site and present such means and methods to the City Representative for review and approval, prior to commencing work.

B. Placement shall conform to Method B placement as designated in Section 72-2.03 of the Standard Specifications. Revetment materials shall be placed to the lines and grades shown on the Project Drawings. Local surface irregularities of the revetment slope shall not vary from the planned slopes by more than 1.0 foot above grade, measured at right angles to the surface of the slope, and shall not in any case be below grade.

C. Rock slope protection fabric shall be placed prior to placing rock slope protection,

when the fabric is shown on the plans, or specified in the special provisions, or ordered by the Engineer.

D. Rock slope protection fabric shall conform to the provisions in Section 96, "Geosynthetics," Section 96-1.002I of the Standard Specifications and shall be placed in conformance with the details shown on the plans and as specified in these specifications. The fabric shall be woven, Class 8.

E. Rock slope protection fabric shall be placed in accordance with provisions set in Section 72-1.03 of the Standard Specifications.

F. Any rip-rap material misplaced and judged objectionable by the City Representative shall be removed by the Contractor at Contractor's expense prior to acceptance of the work.

G. Prior to acceptance of the work, if additional revetment material is required to conform to the sections on the Project Drawings, Contractor shall return to the points requiring such additional revetment material and place same, without any additional compensation.

H. Contractor shall not mound rip-rap materials higher than the thickness indicated on the Project Drawings. Stockpiling of revetment materials adjacent to the top of the slope will not be permitted without the approval of the City Representative.

I. Rip-rap materials shall be carefully placed and worked to provide a minimum of voids. The City Representative may direct the Contractor to rehandle the materials or redress slopes in order to achieve an acceptable finished revetment slope.

3.03 INSPECTION

A. The City Representative will conduct a visual survey of final slope to verify that the final revetment slope conforms to the design intent.

## PART 4 - MEASUREMENT AND PAYMENT

The Contract LUMP SUM price paid for RIP-RAP shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved in furnishing and installing rock slope protection-rip rap, complete in place, as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the engineer.

END OF SECTION

# SECTION 35 51 13.20

# CONCRETE FLOATING DOCK SYSTEM

## PART 1 - GENERAL

### 1.01 SCOPE

A. Work Included: This section includes design, fabrication, labor, materials, and installation of a complete concrete berthing system for the Berkeley Marina Dock Replacement (D&E) Project (Project) of the Base Bid Design addressing the 79 slips and Alternative Bids BA1 – 4ft Finger (1 Total) – 35 ft Long at Dock D (164 SF), BA2 – 4 ft Fingers (2 Total) – 40 ft long each at Dock D (368 SF), BA3 – 4 ft Fingers (2 Total) – 40 ft long each at Dock E (368 SQ) and BA4 – 4ft Fingers (2Total)- 46ft long each at Dock E (416 SF), including but not limited to precast concrete floats and fingers (including ramp landing floats and related); wales, rub rails, and related connectors; guide piles; fire protection system; electrical and domestic water systems; pile guide connections and hardware; and dock accessories such as cleats, filler panels, and bumpers.

B. Applicable Publications: The publications listed below form a part of these Specifications to the extent referenced. The publications are referred to in the text by the basic designation only.

1. American Society of Testing and Materials (ASTM) Publications.
2. American Concrete Institute (ACI) Publications.
3. 2005 California Department of Boating and Waterways (DBAW) Layout and Design Guidelines for Marina Berthing Facilities and other City approved codes.
4. City of Berkeley Fire Department and National Fire Protection Association Standard

### 1.02 GENERAL REQUIREMENTS

A. The dock system shall be made of concrete floats designed in such a manner that modules may be replaced with replacement modules in cases of repairs. The dock system shall have the dimensions shown on the Project Drawings addressing the Base Bid and Alternative Bid Design.

The Designer shall comply with and include all specific details and requirements

identified in these specifications and the Project Drawings. Float designer shall follow all industry accepted details or standards not noted on Project Drawings, Specifications, or within any of the referenced standards. The float designer and fabricator shall have a minimum of five (5) consecutive years experience in the design and manufacturing of concrete floats.

B. Precast Concrete Floats shall be connected to form continuous sections of floating dock with connections capable of transmitting all loads imposed upon individual dock floats, or combination of floats, to the floating dock restraint system.

C. All pre-cast concrete floats shall be delivered to the job site free of defects with no signs of spalling. All floats will be free of structural cracks. Floats shall be stored to prevent damage such as overstressing, warping or twisting. Damaged units will be rejected, indelibly marked and removed from the job site. Units that display repetitive defects or cracking may be cause for rejection.

D. The general dimensions and layout of the berthing system are shown on the Project Drawings. The Contractor shall verify existing conditions and dimensions relating to the Work of this section. Notify the City Representative in writing of any conditions that differ from the drawings. Commencement of Work without such notification shall be construed as acceptance of all conditions.

E. Final dimensions are to be shown on the Shop Drawings. All Work shall conform to the approved Shop Drawings. Construction details, finishing details and colors of the completed berthing system shall be consistent throughout.

F. Each component of the berthing system shall carry a warranty for five (5) years from the date of Project acceptance. Acceptance is clarified to be the date of the beginning of the warranty period of that portion of the Project. The design service life for the floating dock system shall be 30 years.

G. The Contractor shall be limited to the area designated for the construction staging as shown on the Project Drawings. The construction staging area shall be used for the storage of materials and the Contractor's primary work area.

## 1.03 SUBMITTALS

A. Certificates: Before delivery of materials, manufacturer's mill certificates and or certificates of compliance shall be submitted for the following materials:

1. Concrete Admixtures.

2. Portland cement. The certification shall identify the cement: brand name, type, mill location, chloride content, quantity control sample, lot number, and source

of shipment.

3. Steel reinforcement, welded wire fabric, and protective coatings including galvanizing and epoxy.

4. Aggregates. Certified test reports for the following test specified in ASTM C-33, ASTM C330.

5. Lumber grades and treatment certifications

6. Submittals are required for all identified material and as specifically requested by the City Representative.

B. Concrete Mix Design:

1. The Contractor shall provide a certificate for the concrete mix design for the floatation system. The certification must confirm that the mix has been proportioned in accordance with ACI 211.2 or ACI 318 for the specified strength and is based on aggregate data, which has been determined by laboratory tests during the last six months.

2. The mix designs shall be submitted together with the certified test reports or past break history showing the results of the test specified for the various materials, and the results of the 28-day compressive strength tests.

3. If for any reason before or during the course of construction the source of any material for the concrete is changed, quantities varied or deficiency in the strength of the concrete identified the Contractor shall make necessary adjustments to ensure the specified requirements and strengths are maintained.

   All changes and/or corrections to the concrete mix design shall be submitted along with revised test data and shall be at the Contractor's expense.

C. Design Calculations:

1. The Contractor shall employ the services of a Professional Engineer Licensed and Registered in the State of California to be the Designer and prepare all design calculations for the floatation system for the base bid and alternative bid design.

   The Float Designer shall furnish professional and technical support to the Contractor throughout the duration of the construction contract. The float designer may not be changed once the design has been approved.

2. Prior to fabrication of the concrete floats, the Designer shall prepare and submit

complete design calculations to the City Representative for review, including but not limited to, structural and floatation calculations for the entire berthing system for the base bid and alternative bid.

a. Structural Calculations: Structural calculations shall include, but not be limited to, wind and wave loads, impact loads, torsional stability, component connections, cleat anchorage, and pile connections.

b. Floatation Calculation: Floatation calculations are required for all floats.

   The floatation calculations shall include all respective dead loads carried by the specific floats and must demonstrate that the floatation meets performance and freeboard criteria. All means of support used to meet the design freeboard and stability criteria shall be identified and included within the floatation calculation.

   Floatation calculations shall be based on the actual weights of the materials being used to construct the floats for the berthing system, including but not limited to dock accessories, dock utilities, lumber, concrete, hardware, polystyrene core, steel components, and miscellaneous designated dead loads.

c. Handling Calculations: Calculations for loading imposed by the handling and lifting methods to be employed shall be submitted for review and approval and shall be based on the concrete strength expectancy at the time of lifting or moving of the floats.

D. Drawings:

1. Final design drawings for the entire concrete floatation system shall be submitted to the City Representative for review and approval. The final approved design drawings shall bear the seal and signature of the Designer/Engineer of Record and shall be prepared in accordance with the Specifications. The drawings shall indicate all details relative to layout and general construction methods, including conformance with 2005 DBAW guidelines and other approved codes.

   The design of the Fire Protection system shall be prepared and stamped by a Licensed Registered California Engineer certified to design fire systems in accordance with NFPA guidelines.

2. Shop drawings shall be submitted for review and approval.

   Shop Drawings shall identify the specific details relative to fabrication, details of construction, system assembly and erection. Fabrication of the concrete units shall be for the design load conditions and spans indicated on the design drawings (or per design by Float designer) and for any additional loads imposed

by erection of members, openings or support of the work of other trades.

Any specifics relative to the manufacturer's method of operation, including handling, shall be shown on the Shop Drawings and shall be submitted for approval.

The Shop Drawings for concrete docks shall show manufacturer's details and materials for the Work required herein and the following:

a. Marking of the float units for assembly.
b. Connections for work of other trades.
c. Details of lumber, carpentry, hardware, and miscellaneous metal fabrications.
d. Float dimensions, reinforcing, quantities, design weights.
e. Berthing system layout.
f. Float layouts and float identification including phased installation schedule.
g. Electrical routing layouts and future electrical layouts.
h. Plumbing fixture layouts and future plumbing fixture layouts.
i. Fire hose cabinet layout and future hose cabinet layouts.
j. Power pedestal layout and future pedestal layouts.
k. Filler panel and utility details.
l. Cleat layout and connection details.

E. Catalog Sheets: Manufacturer's catalog sheets showing compliance with these Specifications shall be submitted for all standard manufacturers' items.

F. Manufacturing Records:

1. The Contractor shall provide complete and accurate manufacturing records of all floats furnished for the Project.

   The records shall include projected and current float production, float identification, float weights, date cast, related concrete cylinder strength tests and any other quality assurance test or inspection items performed by the fabricator.

   The manufacturing records for the floats shall be updated and kept current with ongoing production activities and submitted upon request. The Contractor shall submit for approval the formats to be used for all manufacturing records.

2. The Contractor shall provide delivery dates and production schedule information for all other materials as part of the manufacturing records.

## 1.04 QUALITY CONTROL PROCEDURES

A. Submit detailed quality control procedures established in accordance with PCI Manual MNL-116 and the General Requirements of these Specifications.

B. Tests and inspections shall be performed by certified testing individuals, engineering companies or testing laboratories for the tests and inspections specified herein and any other such tests or inspections as directed by the City Representative to establish the acceptability of the work.

C. In house testing and inspection services for tests to be performed at the manufacturing plant shall be retained by the Contractor at his expense.

D. Furnish material and handling for test cylinders and any other samples that the City Representative requires for analysis of concrete work.

E. Production Quality Control: Where floats are manufactured in a plant with an established quality control program, as attested to by a current certification in the PCI "Certification Program for Quality Control", perform product quality control in accordance with PCI Manual MNL-116. Where floats are manufactured by specialists or in plants not currently enrolled in the PCI "Certification Program for Quality Control", set up a product quality control system in accordance with PCI Manual MNL-116 and perform concrete and aggregate quality control testing using an independent testing laboratory approved by the City Representative in accordance with the following. Test results shall be submitted to the City Representative.

1. Aggregate Tests: The Contractor shall have samples of the fine and coarse aggregate used at the concrete batch plant tested in accordance with ASTM C-33. Perform mechanical analysis (one test for each aggregate size) including determination of the specific gravity. Tabulate the results of the tests in accordance with ASTM C-33.

2. Strength Tests:
   a. Sample concrete in accordance with ASTM C-172 at the time the concrete is deposited for each production line.
   b. The making and curing of test specimens shall be in accordance with ASTM C 31. Compression tests shall conform to methods of ASTM C-39. Perform slump tests in accordance with ASTM C-143.
   c. A minimum of six (6) cylinders shall be molded and tested for each day of float casting. In the event that more than fifty (50) yards of concrete is batched per day an additional set of six (6) shall be made and tested.
   d. Curing and test of cylinders shall be in accordance with ASTM and ACI standards.
   e. Molding and testing of cylinders shall be performed by ACI certified personnel and a certified testing laboratory.

f. Perform strength tests:
- Two (2) cylinders of each set twenty-eight (28) days after molding the cylinders.
- Test one cylinder of each set at time of removal of floats from forms.
- Test one (1) at time of delivery if delivery is less than 28 days from fabrication.
- Hold two (2) cylinders as spares.

3. Changes in Proportions: If, after evaluation of strength test results, the compressive strength falls below the specified compressive strength, make adjustments in the proportions and water content and changes in the temperature, moisture and curing procedures as necessary to secure the specified strength. Submit all changes to the City Representative in writing.

4. Strength Test Results:
Evaluate compression test results at twenty-eight (28) days in accordance with ACI 214.

5. Reinforcing: Where certified mill test reports (required above under "Submittals") are not furnished or available, or where positive identification of strands or bars cannot be made, the City Representative may require the Contractor to submit samples to an approved testing laboratory for testing at the Contractor's expense.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Cement: Portland cement shall conform to specification ASTM C-150 Type II modified, low alkaline.

B. Water: Water for mixing and curing, including the moisture and water in the aggregate, shall be fresh, clean potable or recycled.

C. Aggregate:

1. Standard weight aggregate shall conform to specification ASTM C–33.

2. Lightweight aggregate shall conform to specification ASTM C-330 for aggregates prepared by expanding products. Lightweight aggregate shall consist of expanded and coated shale or equivalent material of sufficient strength and durability to provide concrete of the required strength and conform to ASTM C-330. Naturally expanded lightweight aggregates are unacceptable.

D. Reinforcement:

1. Reinforcing steel shall conform to ASTM A-615, Grade 60 and shall be epoxy coated in accordance with ASTM A-775.

2. Welded wire mesh shall be electrically welded of cold drawn wire and shall conform to ASTM A-497 Grade 80. Welded wire mesh shall be hot-dipped galvanized.

3. Tie wire used to tie reinforcing steel shall be epoxy or plastic coated.

E. Misc. Metals and Fiber Reinforced Rods

All steel components of the floating dock system shall be ASTM A36. All steel members shall be hot dip galvanized after fabrication in accordance with ASTM A123. All bolt holes, slots, etc. shall be drilled prior to galvanizing. Welding of mild steel shall comply with AWS D 1.1.

Fiber reinforced rods shall have a minimum shear strength of 14,600 pounds, minimum nut strength of 18,000 pounds and clamping force of 4850 pounds.

F. Admixtures:

1. The use of admixtures shall be subject to review and approval of the City Representative.

2. When more than one admixture is used in a mix, the Contractor shall furnish satisfactory evidence that the admixtures to be used are compatible in combination with the cement and aggregates to be used for the Project.

3. No admixtures containing calcium chloride are allowed.

4. Admixtures such as DCI or equivalent shall be used to increase density and reduce porosity of the concrete to provide added security against water intrusion and corrosion of steel reinforcement.

G. Embedments: All embedment's in concrete shall be hot dip galvanized steel, unless noted otherwise.

H. Polystyrene Foam:

1. Foam Core – Foam core for floats shall be rigid block of closed cell expanded polystyrene. The polystyrene foam shall have a unit weight between 0.95 pounds per cubic foot and 1.25 pounds per cubic foot. Properties of the foam shall conform to ASTM D-1621 for density, compressive and flexural strength, water vapor permeability, water absorption and dimension. Storage of polystyrene foam shall be out of direct sunlight prior to the installation in a float

form. Reuse of EPS may not exceed ten percent (10%) of new. Reused EPS pieces shall not exceed 0.5” in diameter.

I. Lumber:

1. Refer to Technical Specification 06 13 33 "Preservative Treated Lumber and Timber"

2.02 CONCRETE

A. Requirements:

1. Concrete mix designs shall be in accordance with ACI 211.2 Chapter 4 and/or ACI 318 Part 6.
2. Concrete for floats fabrication shall be reinforced concrete with minimum compression strength as required by the float designer.
3. Aggregate size shall be sized per the manufacturer’s production requirements.
4. The unit weight of wet concrete shall not exceed 150 pounds per cubic foot.
5. The water/cement ratio shall not exceed 0.45. Proportioning of material shall be accomplished by weighing.

B. Mix Design:

1. Concrete shall be designed in accordance with ACI 318, Part 6.
2. The concrete may be proportioned from additional data derived from ACI 211.2 and ACI 214 for an assumed coefficient of variation of fifteen percent (15%) with a test failure of 1 test in 10, provided that mix designs reflect actual concrete plant standard deviations, and the resulting production concrete conforms to the specified requirements.
3. The mix design shall be based on aggregate data tested within the past six (6) months. In the absence of such data the Contractor shall sample and test the aggregates for conformance with ASTM C-330 and ASTM C-33. Aggregate test results certified by a laboratory shall accompany the mix design.

C. Air-entrained Concrete:

1. If air-entrained admixtures are included within the mix design they shall be added in solution in a portion of the mixing water by means of a mechanical batcher to ensure uniform distribution of the agent.
2. The air content of freshly mixed air-entrained concrete shall not exceed 7½% in accordance with ASTM C-173. The percentage of air shall be determined by

ASTM C-173 on samples of concrete during placing of the concrete.

## 2.03 FABRICATION OF PRECAST CONCRETE FLOAT SYSTEM

A. Formwork:

1. Concrete floats shall be cast in forms of sufficient strength and rigidity to maintain the intended size and shape during the casting process.

2. Forms shall be of plywood or steel.

3. Plywood shall conform to Department of Commerce product standard PS-1 BB concrete form grade Class II, free of raised grain, torn surfaces, worn edges, patches, or other surface defects that would impair the texture of the concrete surface.

4. Surfaces of steel forms shall be free from irregularities, dents and sags.

5. Forms shall be constructed and braced to fabricate the precast float within PCI allowable tolerances.

6. Forms shall be constructed such that floats can be cast without construction joints, however control (contraction) joints shall be provided. Manufacturer shall design and locate control joints to provide long-term durability of the concrete surfaces. Show joints (panel spacing) on shop drawings. Panel spacing rule of maximum 1.25: 1 aspect ratio shall apply for all floating dock surfaces.

7. Forms shall be thoroughly cleaned after each use and contact surfaces shall be coated with non-staining mineral oil or suitable non-staining form coating compound to prevent bonding of the concrete and to leave clean, smooth and hard surfaces. The use of diesel fuel is unacceptable.

8. Forms may be removed within twenty-four (24) hours after placing concrete, providing concrete has attained a rigid set and providing curing procedure as herein required is strictly adhered to.

B. Polystyrene Cores:

1. The exterior concrete surfaces of floats shall form a completely enclosing envelope cast around an expanded polystyrene core. If the bottom of the floatation unit is not encapsulated in concrete, it shall have a rigid membrane to prevent direct contact between the polystyrene foam and seawater, and to prevent the polystyrene foam from marine growth and borers. Alternatively, a rigid cementitious membrane may be used to prevent direct contact between the polystyrene foam and seawater.

2. The core shall be pre-formed to the interior concrete configuration as a solid block of non-interconnected cell expanded polystyrene.

3. Cores shall be securely anchored in place during float construction to prevent displacement or distortion during the casting of concrete. Displacement outside PCI tolerances shall be cause for rejection.

4. Polystyrene cores shall be accurately cut to ensure sufficient concrete coverage for embedments and designed reinforcement. Cores shall be sized to insure a minimum of 1-1/2 inch thick side and end wall sections and a minimum of a 2 inch thick top deck section.

C. PVC Conduit: PVC tubing may be used in conjunction with bolted connections or chases, or for utility routing ducts as long as the PVC is properly sized for the application and sufficient clearances are maintained. All PVC conduit shall be placed true to location shown in the Shop Drawings.

D. Concrete Mixing and Placing:

1. Before handling concrete materials, all handling equipment and forms shall be thoroughly cleaned of concrete splatter, dirt, debris and other foreign matter, and forms shall be coated as specified elsewhere herein.

2. Size of batches shall be so controlled that concrete is placed in forms within one (1) hour after materials have been placed in the mixer.

3. Re-tempering of concrete will not be permitted.

4. Concrete shall be transported from the mixer and deposited in its final position in a manner to prevent separation and segregation of materials. Flowing shall be avoided as causing segregation. Floats shall be cast monolithically and the placing of concrete shall be a continuous operation from the start to the completion of casting of any float unit.

5. The plastic concrete shall be thoroughly compacted during placing by means necessary to fill all form cavities and by surrounding all reinforcement and embedments. This shall be done generally by vibrating forms with a powerful vibrator, care being taken not to vibrate to the extent of floating aggregates. Spading may be done as necessary to position mesh reinforcing but should be limited to the extent that it will not cause air pockets.

6. Temporary, removable spacers may be used to hold reinforcement in place during casting, but these shall not in any way distort forms and shall be removed as the work progresses so that no pockets of non-homogeneous materials will result. Plastic or concrete spacers are also allowed to be used as rebar spacers.

7. Prior to the placing of concrete in any section of the forms, all of the reinforcement and other embedments in that section shall be in place as shown on the Shop Drawings and secured against displacement during the placing of concrete.

E. Concrete Finishing:

1. Concrete deck surfaces shall be broom finished in the (transverse to the main axis of the individual float) direction parallel to the thru-bolt in the float to give a medium, non-slip surface. Submit a 24 inch by 24-inch sample pad of the broom finish for review and approval by the City Representative. All edges shall be finished uniformly 2" back onto the deck with a finishing tool that will give a bull nosed edge to ½" radius.

2. Create all control joints while the concrete is plastic. Exterior surfaces shall be hard, dense, smooth and true within 1/8".

3. Each concrete float shall be permanently marked in an accessible place on the exterior surface.

4. Voids up to 1/2" diameter, 1/8" depth, shall be patched with an approved epoxy grout. Larger voids shall be cause for rejection of the float.

5. Pre-cast concrete containing hairline cracks that are visible, but not measurable by ordinary means, may be accepted. Pre-cast concrete containing structural cracks of width measurable by ordinary means (0.05" wide and over) shall require the approval of the City Representative.

F. Curing, Handling and Storage:

1. Except, as otherwise approved, floats shall be cured per PCI or Caltrans requirements using water, curing compound or steam.

2. Float castings shall remain in their place of casting until sufficient stripping strength is attained to prevent damage during stripping and handling. Stripping and handling criteria shall be as identified in the Contractor's Quality Control Procedures.

3. During the curing/storage period floats shall be protected against damage from any cause.

4. Concrete surfaces shall be free of fins or form marks, aggregate pockets, or water pockets.

5. Shipping and handling of the floats is the sole responsibility of the Contractor. Damage during shipping and handling shall be repaired prior to installation. Repair methods and procedures shall be submitted and approved by the City Representative.

## 2.04 DOCK PILE GUIDES/RUB BLOCKS

A. Rub blocks and strips shall be black Ultra-High Molecular Weight (UHMW) polyethylene. UHMW shall have a minimum density of 0.93 per ASTM D-792, minimum hardness of sixty-eight (68) per ASTM-D-2240, coefficient of static

friction to steel of 0.20 per ASTM D-1894, and UV stability for use in direct sunlight. Block and strips shall be secured with Type 316 stainless or galvanized steel fasteners. Fasteners shall be counter bored to allow flush contact without damage to piles or floats.

2.05 DOCK CLEATS

A. Dock cleats shall be gray cast iron, hot-dipped galvanized, open base heavy duty cleats (model number as noted on drawings) as supplied by Henderson Marine Supply, or approved equal. Bolt heads shall be recessed into cleats; use hot-dipped galvanized bolts. Cleat sizes shall be as follows:

10” – Slips upto 40' in length
12” – Slips 41’ to 60' in length

2.06 DOCK BUMPERS

A. Dock bumpers shall be #302 as supplied by Henderson Marine Supply or approved equal. All outside corners shall be protected with #03-06A corner bumpers or approved equal, attachment to be with large head stainless steel or aluminum nails, 4-inch on center in the vertical surface and 4” on center in the horizontal surface.

2.07 FILLER PANELS

A. Filler panels for triangles finger connections and pile assemblies shall not be constructed using plywood. The designer shall identify a material applicable for the application with sufficient strength and aesthetic value. Cut openings in filler panels to accommodate pile penetrations shall not be over cut more that one (1) and 1/8 inch in any direction around the pile. Filler panels will be flush with the concrete deck surface and structurally supported in all directions.

## PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation shall be as shown on the Project Drawings with bolts and other connections tightened as required after complete installation of each unit of the work in the water and before final inspection.

B. The dock system uses walers that are not considered structural. The lumber shall have a maximum 1/4-inch gap between adjacent pieces. The length of each waler shall be as long as possible but at no time will walers be secured to the floats with less then two (2) bolts. Minimum bolt size shall be 5/8” diameter.

C. Top of walers and trim lumber adjacent to the floats shall all be flush with the finished concrete deck surface.

D. When triangle fillets and pile frame assemblies are used adjacent to the floats all surfaces shall be flush with the finished deck surface.

E. Lumber joints of wood members abutting at 90 degrees shall be cut and assembled true and level. Lumber joints at other then 90 degrees shall be mitered to provide a true and level joint.

F. Structural steel fabrication and installation shall conform to the requirements of AISC Specifications for the design, fabrication and erection of structural steel.

G. Fabricated steel components shall be designed for the application plus provide support for such items as power centers, locker boxes and fire hose cabinets, foot traffic and opening around concrete pile.

H. Fabricated steel components used to secure concrete pile shall provide means for positive adjustment to accommodate pile location.

I. All welding shall be performed by certified welders and shall conform to the current specifications of the American Welding Society (AWS).

J. Hot dipped galvanized iron round plate washers shall be used under all bolt heads and nuts on wood, except where cut washers are required.

K. Bolts shall be of the size required, with adequate thread length. All lag bolts and screws shall be pre-bored and turned into place. Driving will not be allowed.

## 3.02 INSTALLATION OF DOCK ACCESSORIES

A. All dock accessories shall be installed in accordance with the Approved Shop Drawings and the manufacturer's recommended method of installation.

B. Schedule installation of dock accessories so as to prevent damage from work by other trades.

C. Special attention shall be given to locating of the fire hose cabinets and power pedestals to avoid those locations that will present the potential for damage during mooring activities.

## 3.03 DESIGN CRITERIA

A. The floats shall have sufficient floatation to support a live load of twenty-five (25) pounds per square foot of deck area with a freeboard of not less than twelve (12) inches.

The dock structures shall have sufficient floatation to support the transmitted dead load and live load of the gangways. At electrical equipment such as power centers, the dock structures shall have sufficient floatation to support the transmitted dead

load of all equipment and adjacent live load.

The floatation calculations for floats with imposed loads such as gangways, power centers, pile assemblies and special applications shall include the imposed loads as part of the floatation calculation.

The freeboard under these imposed loads shall meet the requirements for transverse and longitudinal slopes set forth in the TOLERANCE section 3.04 below.

B. Uniform freeboard under dead load shall not be less than sixteen inches (16") or exceed eighteen inches (18").

The floatation units shall be capable of supporting a 400-pound concentrated load at any location while maintaining the deck surface slope requirements, set forth in Section 3.04 B below.

C. The floatation units shall be capable of withstanding anticipated current (C) loads of 2.0 feet per second, impact loads from a 60 ton vessel impacting at 1.0 feet/sec approach velocity (kinetic energy loading of a 1/3 stress increase is allowed since the force is transient), a 1.0 foot wave (W) (Operating condition, 1/3 stress increase) and a 2.0 foot wave (W) (Extreme condition, 1/3 increase allowed.

D. Load Combination shall be as following:

LRFD
1.2C + 1.6W
1.2C + 1.2W + 1.6 Wa (operational)
1.2C + 1.2W + 1.2 Wa (extreme)

ASD
1.0C + 1.0W (Allowable Overstress 1.0)
1.0C + 1.0W + 1.0 Wa (operational) (Allowable Overstress 1.0)
1.0C + 1.0W + 1.0 Wa (extreme) (Allowable Overstress 1.33)

E. Lateral Load shall be applied at +7.5 MLLW.

F. Dead loads shall consist of the floats, framing, decking connections, and all permanently attached equipment.

The weight of lumber for dead load calculations shall be assumed at not less than forty (40) pounds per cubic foot or the actual lumber weight, whichever is greater.

G. Wind (W) loads for the finger floats shall be a uniformly distributed load of fifteen (15) pounds per square foot acting on the above water profile of potential berthed craft.

The profile area shall be determined by using the length and an average profile

height equal to fifteen percent (15%) of the boat length.

## 3.04 TOLERANCES

Install berthing system to within the following tolerances from the planned dimensions shown on the Project Drawings. All floats exceeding the specified tolerance shall be removed and properly replaced at no cost to the City.

A. Float Fabrication (allowable variation of construction dimension from nominal dimension shown on Plans):

1. Float Width: +5 inches, -0 inches from nominal float width
2. Float Depth: As required to satisfy freeboard requirements.

   NOTE: The above tolerances are intended to permit flexibility, adapting available formwork for use on this Project. Once the construction dimension is fixed by the Contractor, more stringent casting tolerances shall govern.

B. Berthing System Performance In-Place After One Year

1. Minimum Dead load dock freeboard (measured from deck to water surface): 16 inches.
2. Dead load shall include dead load of all dock utilities, dock accessories, gangways, pile assemblies, transformers, etc.
3. Dead load deck surface slope:

| | | |
|---|---|---|
| a. | Finger and main walkway transverse direction | Not more than ¼ inch per foot of nominal width to an overall maximum of 1” |
| b. | Marginal walkway transverse direction | Not more than 1/8 inch per foot of nominal width to a maximum of 1” |
| c. | All docks longitudinal | Not more than 1 inch per 10-foot length while direction remaining within the freeboard tolerances |

4. Assembly gap between adjoining concrete floats: minimum ¼ inch, maximum ½ inch.
5. Vertical height difference: maximum 1/8 inch between adjoining concrete floats, walers and plywood deck panels.

6. Float weight: (+ or -) 6% of design weight

3.05 FLOAT PRODUCTION - BASIS FOR ACCEPTANCE

A. The Contractor is responsible for providing the highest quality product from the float manufacturer, fabricators, material suppliers, and all other vendor. Quality inspection and acceptance for delivery to the project site prior to installation is the responsibility of the Contractor. The Contract documents shall be the basis for the level of quality expected for the project. Final acceptance is the sole discretion of the City Representative.

B. The deck finish shall be consistent over the entire surface of the float including an even broom finish without waves or irregularities. Finish shall be free of any debris or markings other then the broom finish. The deck finish shall be based on the sample submitted by the Contractor and approved by the City Representative.

C. Floats shall be edged straight and with a hardened smooth finish. Edges shall be consistent without waves or rolled edges or corners.

D. Each float shall be square and of the same height, width, and length as indicated on the Shop Drawings.

E. The side-walls and end-walls shall have a consistent smooth finish free of voids and/or large rock pockets, or show evidence of insufficient vibration or improper concrete consolidation.

F. Cast-in components such as junction boxes, PVC tubing, handling inserts, or other embeds shall be flush to adjacent surfaces and shall not alter the overall finish or impact the assembly.

G. Prior to acceptance the Contractor shall supply the following: acceptable concrete strength and testing results, respective material certificates of compliance, verification of float weights, and respective production Quality Control documentation.

H. Floats shall be permanently marked with the approved marking system and shall include the date of production, float type and any other reference marking relating to the production Quality Control procedures.

## PART 4 - MEASUREMENT AND PAYMENT

The Contract LUMP SUM price paid for OFFSHORE MARINA AND APPURTENANCES shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved in furnishing and installing concrete floating dock system, complete in place, including concrete footings as needed, as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the engineer.

## PART 5 - PRODUCT DATA SHEETS

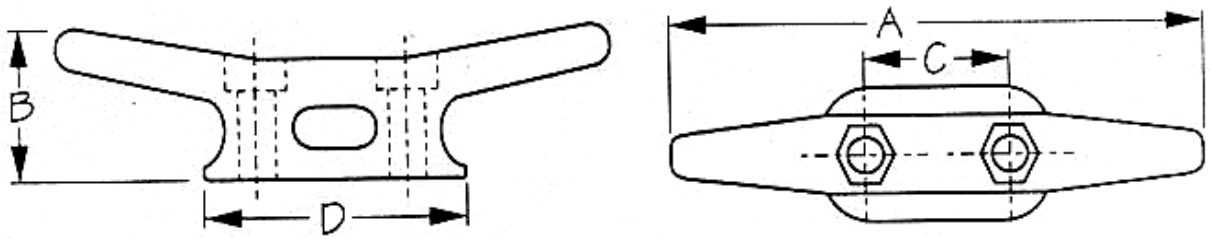
# Henderson 504H Cleats


**HENDERSON 504H CLEAT**

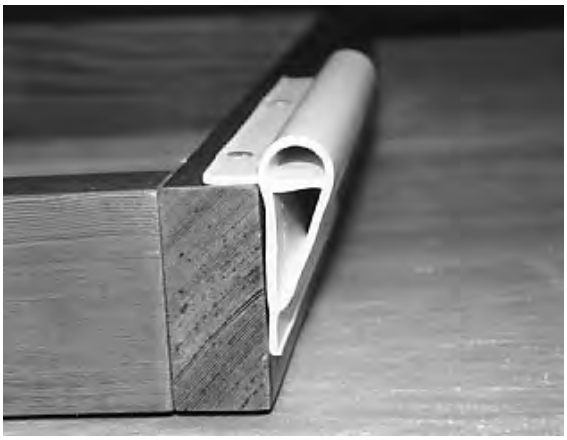
CAST DUCTILE IRON – HOT DIPPED GALVANIZED

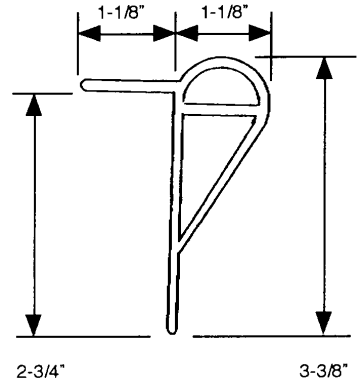
These cleats are designed for general installation where medium and large cleats are required. These cleats are the key to safely mooring a vessel to a dock; therefore, the cleat should always be bolted completely through the main structure of the dock. Designed with recessed mounting holes to accommodate hex head machine bolts.

| ITEM NO. | NAME | A | B | C | D | Holes for Bolt Diameter | Weight |
|---|---|---|---|---|---|---|---|
| 05-07N | IAN | 8” | 2 3/8” | 2” | 4” x 2 ¼” | ½” | 3 lbs. |
| 05-08N | WYMAN | 10” | 3 ¼” | 2 ½” | 4 5/8” x 2 ½” | ½” | 6 |
| 05-09N | DICK | 12” | 3 3/8” | 3 ¼” | 6 7/8” x 3” | 5/8” | 11 |
| 05-10N | DAWSON | 15” | 3 ¾” | 3 ½” | 7 ¼” x 3 ½” | ¾” | 12.75 |
| 05-11N | BRIAN | 18” | 4 ½” | 3 7/8” | 7 ½” x 4” | ¾” | 21 |
| 05-12N | WILD BILL | 24” | 5” | 6 5/16” | 13” x 4 ½” | 7/8” | 35 |



# Henderson Bumper Strips





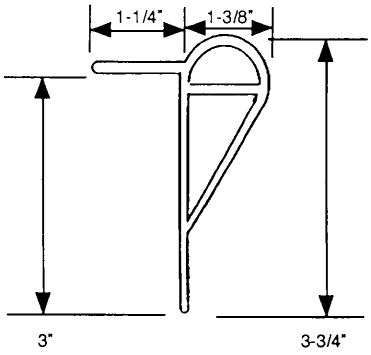

**302 HENDERSON HEAVY WEIGHT BUMPER STRIP**
**ITEM NO. 03-02**

**Material:** Designed and extruded from marine-grade vinyl, resistant to yellowing. Meets commercial standard CS230-60.

**Weight:** 0.85 pounds per foot. **Average Wall Thickness:** 5/32"

**Packaging:** 12 pieces of 8-foot lengths per shipping carton, 96 feet total.

**Application:** On wood structures, nail with large-headed aluminum or stainless steel nails, 4 inches on center of top and bottom flanges. On metal structures, use stainless steel or aluminum sheet metal screws and washers.




**310 HENDERSON EXTRA WEIGHT BUMPER STRIP**
**ITEM NO. 03-10**

**Material:** Designed and extruded from marine-grade vinyl, resistant to yellowing. Meets commercial standard CS230-60.

**Weight:** 1.35 pounds per foot. **Average Wall Thickness:** 5/32"

**Packaging:** 10 pieces of 8-foot lengths per shipping carton, 80 feet total.

**Application:** On wood structures, nail with large-headed aluminum or stainless steel nails, 4 inches on center of top and bottom flanges. On metal structures, use stainless steel or aluminum sheet metal screws and washers.

*For corner dock protection see catalog page 03-5. For orders less than full cases, a 25% "split case" charge will apply.*

END OF SECTION